FOOD MANUFACTURE

Incorporating Food Industries Weekly

ARD HILL LIMITED, 17, STRATFORD PLACE, LONDON, W.1 [illegible] 1949

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D.91

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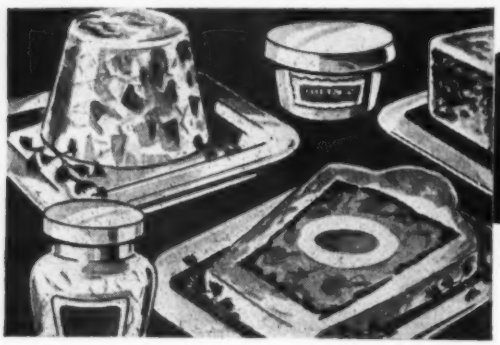

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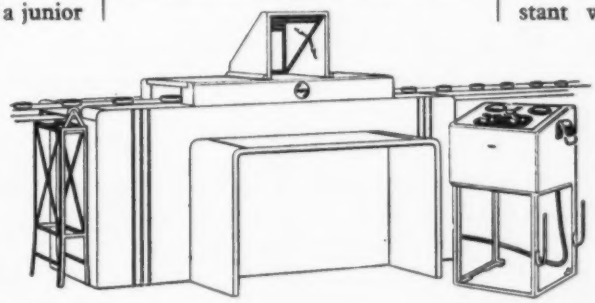

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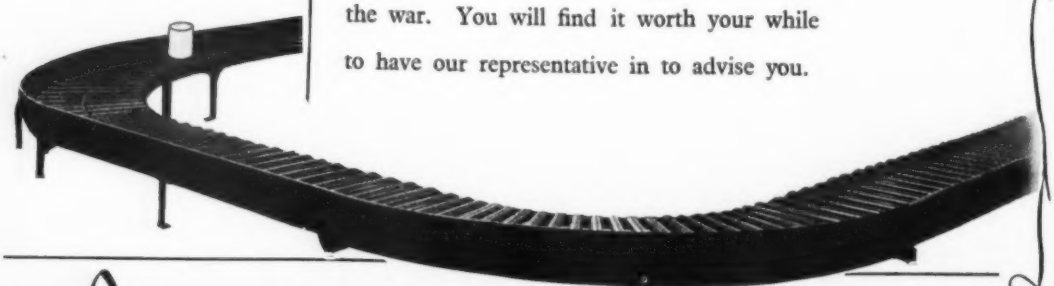
A Jenner Conveyor in use in a modern bakery.



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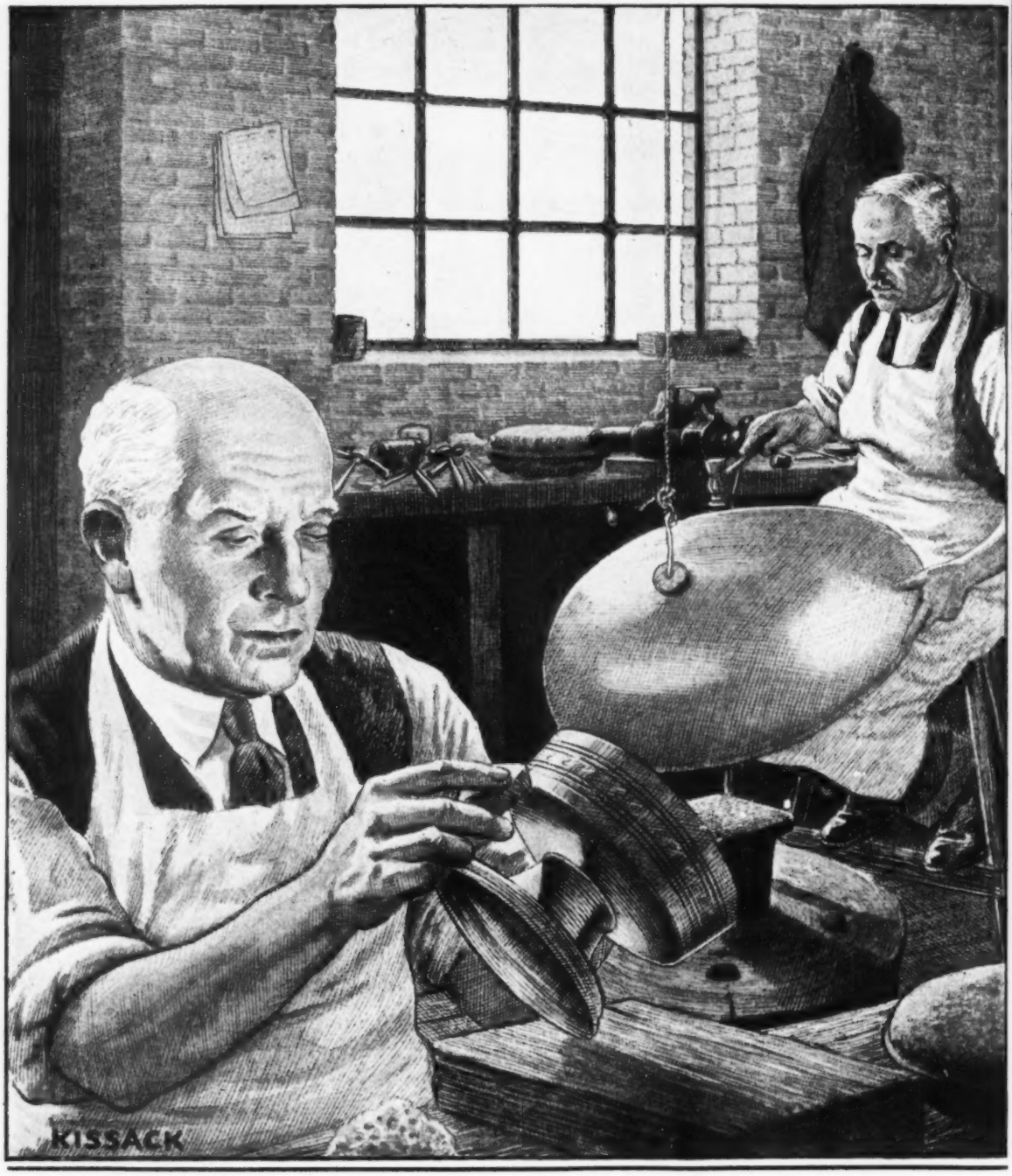

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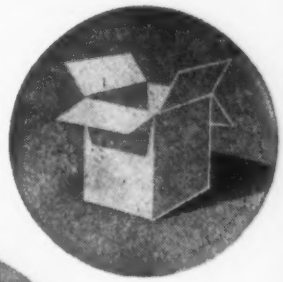
578

This news makes names

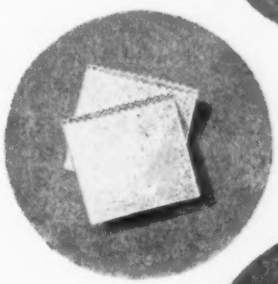
These well established companies in the paper-conversion trade have just changed their names. They have done so to mark their association in a Bowater packaging service. They are : —



BOWATERS FIBRE CONTAINERS Limited

of Purley Way, Croydon, Surrey

(formerly the Acme Corrugated Paper and Box Company Limited).



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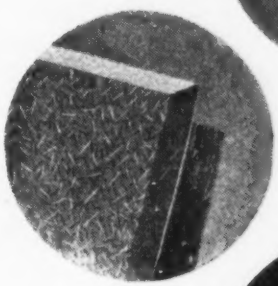

together with BOWATERS BUILDING BOARDS Limited (formerly Lloyds Boards Limited), they also form the nucleus of a new Bowater division :—

ASSOCIATED BOWATER INDUSTRIES LTD.

HAREWOOD HOUSE, HANOVER SQUARE, LONDON, W.1

"Pleaster meetyer, Prof."

Will Might, the Mill-wright
———and the PROF.
Set-too, No. ONE

"I regret, Mr. Might, that I cannot be equally effusive. I rate men like you no higher than grub-screws. It could be little pleasure to me even were you worth meeting, which you are not."

"That's O.K. with me, Prof. We practical men think you're nuts, anyway — nuts rusted up, rounded-off with the wrong size spanner, immovable 'cept with a hack-saw. It's good to start by knowing one another, ain't it old cock?"

"I dislike you intensely, my man, but find your rudeness stimulating. As I understand it, we are to form a two-piece brains trust in this series of advertisements. We will speak fearlessly to one another. I represent brains and you represent brawn—if I may coin a phrase. But don't call me old cock."

"No, old cock, I represent practical experience and you, theory. But we will agree on one thing. I always use Hendrys' Belts, and you always advocate their use, although as far as you *know* belts are used only to keep pants up."

Hendrys'
BELTING

JAMES HENDRY LIMITED
LAMINATED LEATHER WORKS
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The choice every time!

your product ?

IT COULD BE ! It is the product with that little extra something, that piquant appetising flavour, which so delights the whole family. That brand is always chosen now. The manufacturer knew the secret of improving even his fine recipe by adding PROTEX—the concentrated hydrolysed protein, so essential to make a brand the popular choice. Why not ask about PROTEX now?

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preparations.

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Yes, you, Sir. You've helped C.R.S no end in the past—helped us to reach a weekly collection of nearly 1,200,000 empty containers, but to meet national requirements we need at least 250,000 more every week. *That's five more empty containers from every trader on whom C.R.S calls, and we're counting on you, and thousands like you, for a bumper response.*

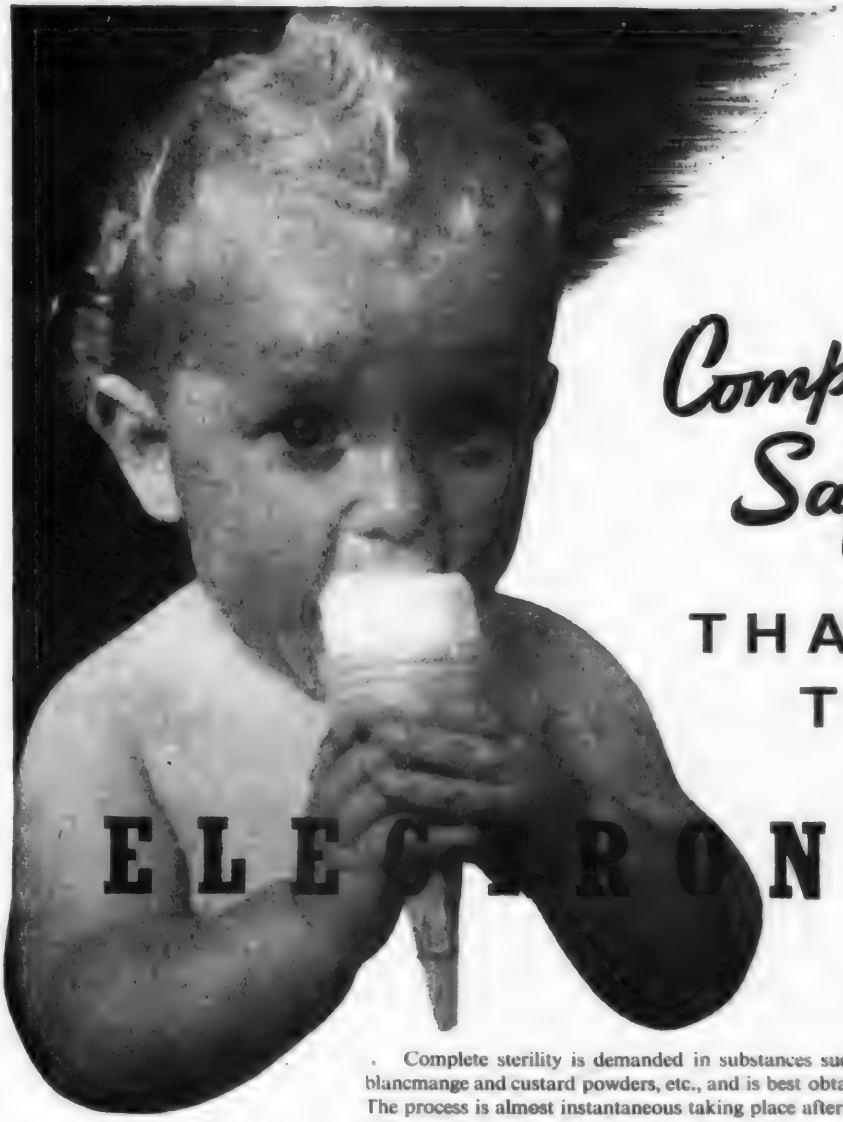
DO YOU REALISE what an important part the return of empty containers is playing in the campaign for national economy? It not only safeguards delivery of Britain's rations—but it saves the nation thousands of tons of precious coal, as well as timber, wood-pulp, metal and other essential raw materials that are needed for export manufacture. It's up to you—remember that when the C.R.S van calls!

Look for this van sign before you hand them over

Container Recovery Service

S.P.D. Limited, 3/5 Salisbury Square, London, E.C.4

CRS 53B-940



Completely Safe –

THANKS TO

ELECTRONICS

Complete sterility is demanded in substances such as ice cream powders, blancmange and custard powders, etc., and is best obtained by dielectric heating. The process is almost instantaneous taking place after final sealing of packages with a marked saving in production costs.

This is only one of a wide range of dielectric and induction heating processes now available by use of Airmec Electronic Heater Generators. Pre-heating of moulding materials, setting of wood adhesives, soldering and brazing, case hardening, powder metallurgy are economically carried out by electronic methods.

Maybe your output and products could be aided and improved electronically.

List GA157 fully explains our equipment – we will gladly send you a copy and advise on production problems. Please do not hesitate to enquire.

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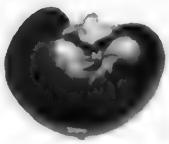
Manufacturers of all types of industrial electronic equipment and test gear



Process your soups in Nickel Equipment

For nickel ensures that the purity of your product is safeguarded; and for rapid heat transference, it is superior to other metals, having comparable strength and corrosion-resistance.

HENRY WIGGIN AND COMPANY LTD BIRMINGHAM 16

BWF6

STABILISING SUSPENSIONS WITH A & W SODIUM ALGINATE

(MANUCOL BRAND)

The separation of suspensions by sedimentation or creaming is sometimes useful, but it is often more desirable that this process should not take place.

Fruit Squash is an example of a product which normally separates readily. The pulp may be kept uniformly suspended without "ring" by addition of 0.15% of Manucol.

Without Manucol. *Suspension of Fruit Squash. Both photographed after standing for 24 hours* *With 0.15% Manucol*

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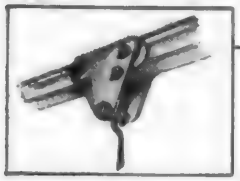
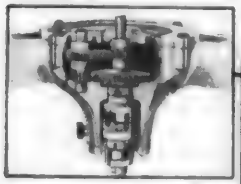
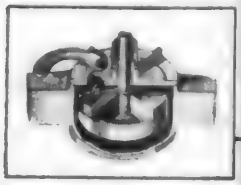
SIEVING & GRADING MACHINES



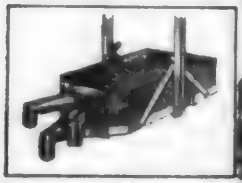
For easy movement across the factory, machine can be suspended from trolley running on an H joist.



Transmission from motor to main shaft is through a gear train, running in an oil-bath.



Amount of vibration can be varied by simple adjustment of specially designed fly-wheel.



Automatic sieving in several sizes simultaneously, by arranging a number of trays one above the other, as shown.

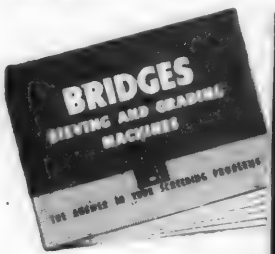
Bridges Sieving and Grading Machines, working on the principle of direct vibration, screen all types of material (wet or dry) more satisfactorily, more quickly and more cheaply. Sturdily built, well balanced and well finished, they will give many years of trouble-free service.

IF YOU REQUIRE TO SCREEN ANY OF THESE MATERIALS

Model B. Screening Dimensions. 21½" x 39½".

• Asphalt (granulated) • Barley • Cocoa • Custard Powders • Carbon • Chemicals—for Rubber and Paper Industries and Electrode Manufacture • Cinnamon • Colours (Liquid) • Face Powder • Gravel • Gun Powder • Lead Pellets • Lacquers • Meal • Milk Powder • Chalk • Coal • Flour • Paints • Sugar (granulated or ground) • Spices • Sweets • Soap • Sand • Semolina • Salt • Varnish, etc., etc., etc.

YOU NEED A BRIDGES SIEVING AND GRADING MACHINE



Write for attractive illustrated brochure in colour showing Bridges Sieving and Grading Machines in use, and giving full details of every machine, to address below.

Model A. Screening Dimensions: 21½ ins. dia.

Model C. Screening Dimensions: 29½ ins. dia.

Model D. Screening Dimensions: 29½ ins. x 51 ins.

'Baby' Screening Dimensions: 16½ ins. dia. Light, handy machine for small factories, etc.

S. N. BRIDGES & CO., LTD.

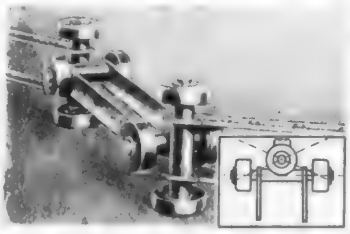
PARSONS GREEN LANE, LONDON, S.W.6 • RENown 1177/8

NEVER BEFORE SUCH CONVEYOR PERFORMANCE!

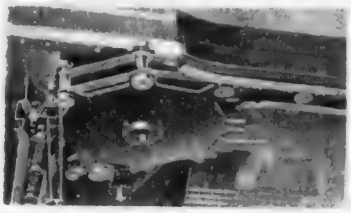
Flowlink

GOES WHERE OTHERS CAN'T

1. *Ascends or descends* VERTICALLY TO ANY LEVEL *and returns* IN ONLY 16 FT. OF HORIZONTAL DISTANCE.
   (*An orthodox conveyor takes 41 ft. to rise 8 ft.*)
2. *Turns—horizontally on a radius of 2'6", vertically on a radius of 4'.*
3. *Links multi-floor factories from roof to basement in one* CONTINUOUS *conveyor system.*
4. *Serpents in and out between closely placed plant.*
5. *Weaves round or over any fixed obstacle.*



CHAIN AND TROLLEY UNIT *Note the stable position of pivotal point in the trolley unit. This distributes load evenly to both sides of bearings, track and double link chain and results in longer wear. All stresses are confined within the track leaving no strain on factory roof or other structure except the actual weight of the conveyor and its load. All rollers run on ball bearings. This means exceptionally low coefficient of friction—and very low running costs.*



DRIVE UNIT AND TRACK *Flowlink may have any length of track, as additional drive units may be installed at any point to compensate for load increases. Because of Flowlink's low coefficient of friction, little operative power is required.*

THE manhour and manpower saving of *continuous* line production can now be applied to any combination of factory floors. For Flowlink, with its incomparable multi-directional power of movement and sharp angle of turn, takes different levels in its stride, conveys from the horizontal to the vertical and vice versa as often as may be required, links every operation, spans the whole building from top to bottom with one endless conveyor circuit and operates in less space than any other conveyor devised. With Flowlink, the need for separate conveyor systems and their inevitable interruptions in production sequence has gone.

Flowlink is of pressed steel unit construction. All units are fully interchangeable, making Flowlink not only easy to erect but to adapt to any subsequent change in your operational requirements. Write for full details. Preliminary report on the application of Flowlink to your own problems will be prepared on request.

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GRIDWAY DIVISION

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LONDON OFFICE: 110-111 STRAND, W.C.2
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NO DARK CORNERS IN THIS TYPICAL FACTORY BAY . . .

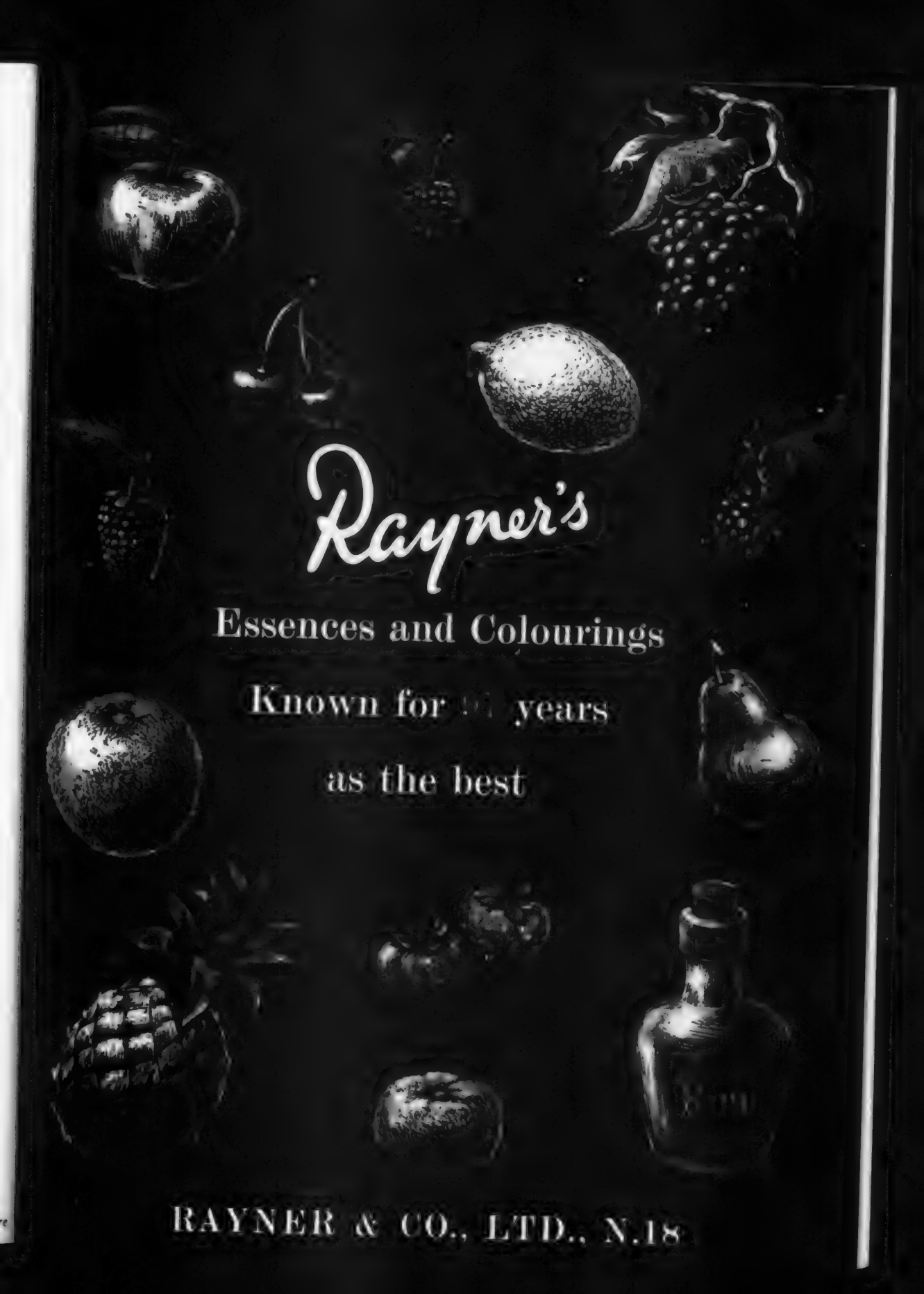
Such lighting is available now for all industries

Its efficiency helps to speed up work and cut down mistakes. Employees appreciate the better seeing conditions—the greater brilliance, the reduced glare, the absence of harsh shadows. Against Tungsten Lamps of comparable light output, OSRAM Fluorescent Lamps show a great saving of electricity and, in G.E.C. Fittings, make an attractive lighting installation for present-day industrial needs.

Osram **FLUORESCENT LIGHTING and G.E.C. Fittings**

★ THE ADVISORY SERVICE OF G.E.C. ILLUMINATING ENGINEERS IS AT YOUR DISPOSAL WITHOUT OBLIGATION

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2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Essences and Colourings
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as the best
RAYNER & CO., LTD., N.18

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The time is not yet here when we can supply *everyone* with *all* their needs. Raw material shortages will continue to curtail deliveries, *so make the most of available supplies.* Within current limitations we do our best and will continue to allocate production fairly among our many customers. In the meantime we urge all users to speed up the recovery of returnable containers.

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Protect the flavour and appearance of your product and deliver in glass. *The* economical method of delivery.

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U.G.B. Beer and Mineral series spell accurate capacity, long life and maximum trippage.

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The universally popular and now improved Kilner Jar used in home bottling.

food containers

Over a wide range of other foodstuffs it pays to pack and present in glass. Preferably and when available, in U.G.B. Glass.

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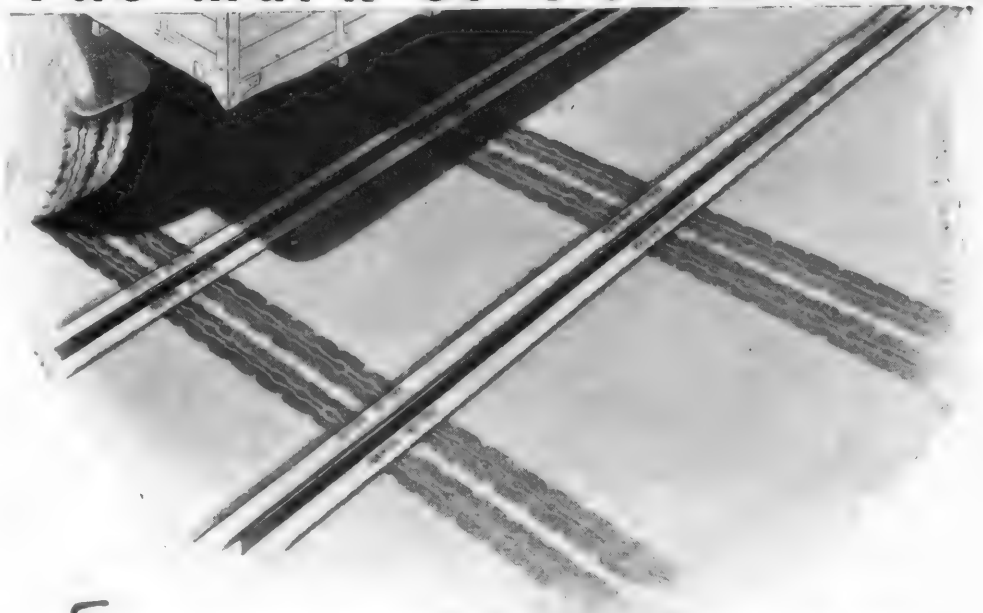
Tel.: GERRARD 8611 (15 Lines) Grams: UNGLABOMAN, LESQUARE, LONDON

The mark of TYRES . . .



Sidings laid flush in tar-mac or concrete permit dual use of the ground they occupy ; both road and rail transport have direct access to points where loading and unloading take place.

A railway siding should be an integral part of works and stores layout ; this is the objective of our engineers when planning the installation of new, or the modification of existing sidings. Whenever the utmost flexibility is required in the routeing of freight traffic to and from loading bays, we recommend the installation of dual transport roads.

Flush-laid sidings designed and installed by us are entirely obstructionless ; the whole of the track and fittings, including lever boxes and rodding, are sunk flush with the level of the concrete or tar-mac. Foot traffic is protected, the danger of feet being trapped is removed by a specially designed form of turn-out ; the maximum clearance between running and guard-rail, even at the point of the switches, is no more than 3¼ inches.

Specialists in the planning, installation and maintenance of Railway Sidings for over 100 years.

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THOMAS SUMMERSON AND SONS LIMITED • DARLINGTON

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CHARLECOTE PARK, WARWICK

Where Shakespeare poached . . . In the lush meadows where the river Avon winds from Warwick to Stratford stands Charlecote Park, home of the Lucy family since the twelfth century. Here, tradition says, Shakespeare came poaching, and was caught: and was later to bring the punishing magistrate to the stage as Mr. Justice Swallow, fussy squire of Henry IV and The Merry Wives.

Today Charlecote Park is "all that an English Park should be"—undulating, well-watered, abounding in ancient trees, and stocked with a herd of fallow deer and rare Spanish sheep.

In 1945 Sir Montgomerie Fairfax-Lucy presented to the National Trust the Park, of 200 acres, the house, pictures and library of very many volumes.

The National Trust exists for the protection of places of historic interest or natural beauty. To protect the products of modern industry, you can place your trust in National Corrugated Cases.

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100% PURE EX CLOVE OIL

EASY HANDLING

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Per Cent Propylene Glycol By Volume	Ounces vanillin per imperial gallon solvent mixture at temperature fahrenheit					
	32°	50°	68°	77°	86°	104°
20	0.80	1.60	1.92	3.45	4.80	10.10
40	1.99	3.19	4.8	10.10	14.10	30.00
60	6.13	9.62	16.02	23.70	40.10	96.20
80	12.40	20.40	32.10	38.50	56.20	105.60
100	12.68	20.40	33.70	39.25	56.20	112.20

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FOR ALL DUTIES
Pioneers in the Universal Application of Totally Enclosed Motors
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RUBBER RINGS

GUARANTEED QUALITIES CONFORMING WITH THE SUGGESTED STANDARD OF THE FOOD AND DRUGS ACTS. for Phoenix, Automatic and Flat Caps, Sealing Compounds and Gummi Rings. Rubber Moulds for Fondants, etc.
Every description of Rubber goods for the Food Trade.

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TEL POPESGROVE 2271 GRAMS POPPE TWICKENHAM

. . . seal it with "DUREX" Cellulose TAPE

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Instantly adhesive . . . No heat or moisture required—simply apply with light finger pressure and it sticks . . . "DUREX" Cellulose TAPE is the perfect seal for packs of any shape or size . . . it is the most satisfactory closure for the moisture-proof type of Cellulose film . . .

Write today for full details and prices.

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"DUREX" Cellulose TAPE

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In Three Chapters
A Tale worth Telling
CHAPTER I
SUPER "ZINNATINE"
CHAPTER II
"SULFATINE"
CHAPTER III
"ZINNATINE MARINA"
THE preservation of fish, fruit and vegetables in containers, treated with acid and sulphur-resisting lacquers by ARTHUR HOLDEN & SONS LTD. is no fairy tale.
Their famous trio—"Super Zinnatine" for fruits; "Super Sulfatine" for vegetables and meats; and "Zinnatine Marina" for fish positively guarantee perfect preservation of the natural colour and flavour of the original product. These lacquers give security in every can—and that's the security that makes the best propaganda for your product.
BEST QUALITY
MARRO
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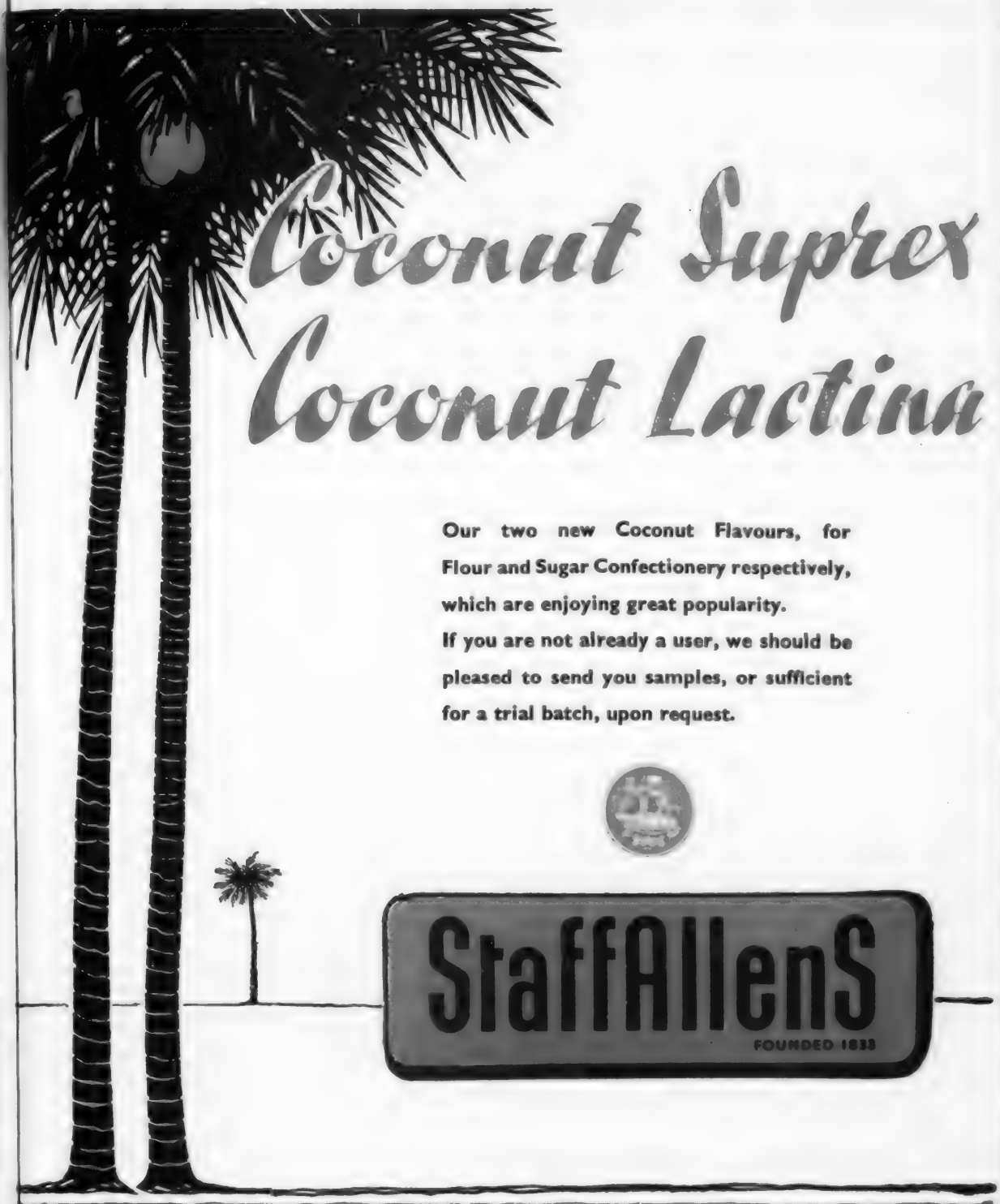
THE PIONEER LACQUER MANUFACTURERS
ARTHUR HOLDEN & SONS LIMITED BIRMINGHAM



Coconut Suprex
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Our two new Coconut Flavours, for Flour and Sugar Confectionery respectively, which are enjoying great popularity.
If you are not already a user, we should be pleased to send you samples, or sufficient for a trial batch, upon request.

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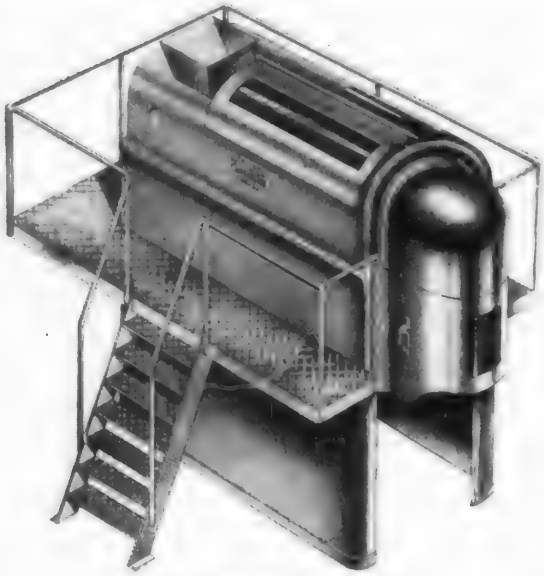
N. C. R. RONCA-DA-VINCI

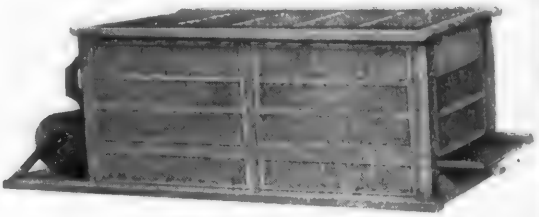
Macaroni Machinery and Equipment



1. The Ronca-da-Vinci

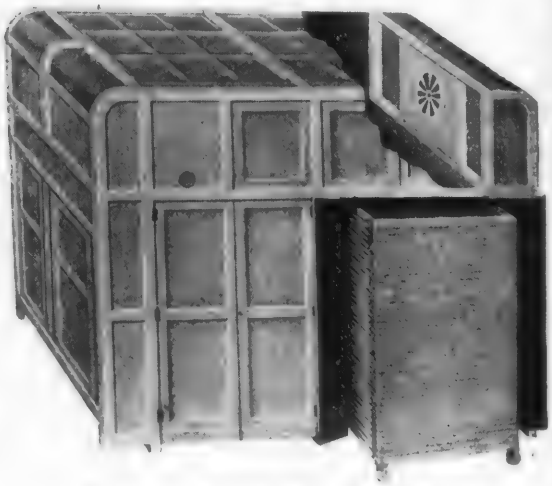
H. A. Nabi has great pleasure in introducing the only 100% automatic press, the "N. C. R. RONCA-DA-VINCI," for all kinds of long and short cut goods. This press maintains a continuous output of 700 lbs. per hour. The design is ultra-modern, and operation is simple. This machine is fitted with double head to facilitate change of dies without interrupting production.

100% BRITISH MANUFACTURE



2. Preliminary Drier

3. Finishing Drier for long goods



4. Finishing Drier for short cut goods

This equipment is particularly suited for export and enquiries are specially welcome from overseas food manufacturers. A smaller type of machine is available.

H. A. NABI Ltd. **2, BEECH ROAD, ST. ALBANS, HERTS.**
Telephone: ST. ALBANS 5542

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Rubber Rings and Discs

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QUALITY, ACCURACY, DELIVERY

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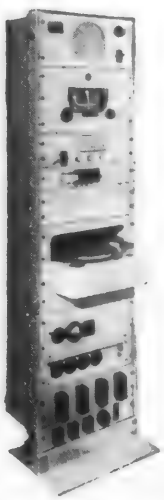
The G.E.C. sound system will provide your factory with a complete and comprehensive sound service.

Facilities are provided for staff control, location of individuals, automatic time signals, fire alarms, and " Music while you work," either by record playing or radio programmes.

Before installing any equipment, your factory will be " measured for sound " by G.E.C. specialists, who will ensure that the equipment installed is best suited to the acoustic requirements of your buildings.

No modern factory is complete without a sound system. It can be used to great advantage in improving works relations, giving instructional talks and in putting over your own personal messages.

A quotation will gladly be given upon request.



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TIME SIGNALS

LOCATION OF INDIVIDUALS

STAFF CONTROL

MUSIC WHILE YOU WORK

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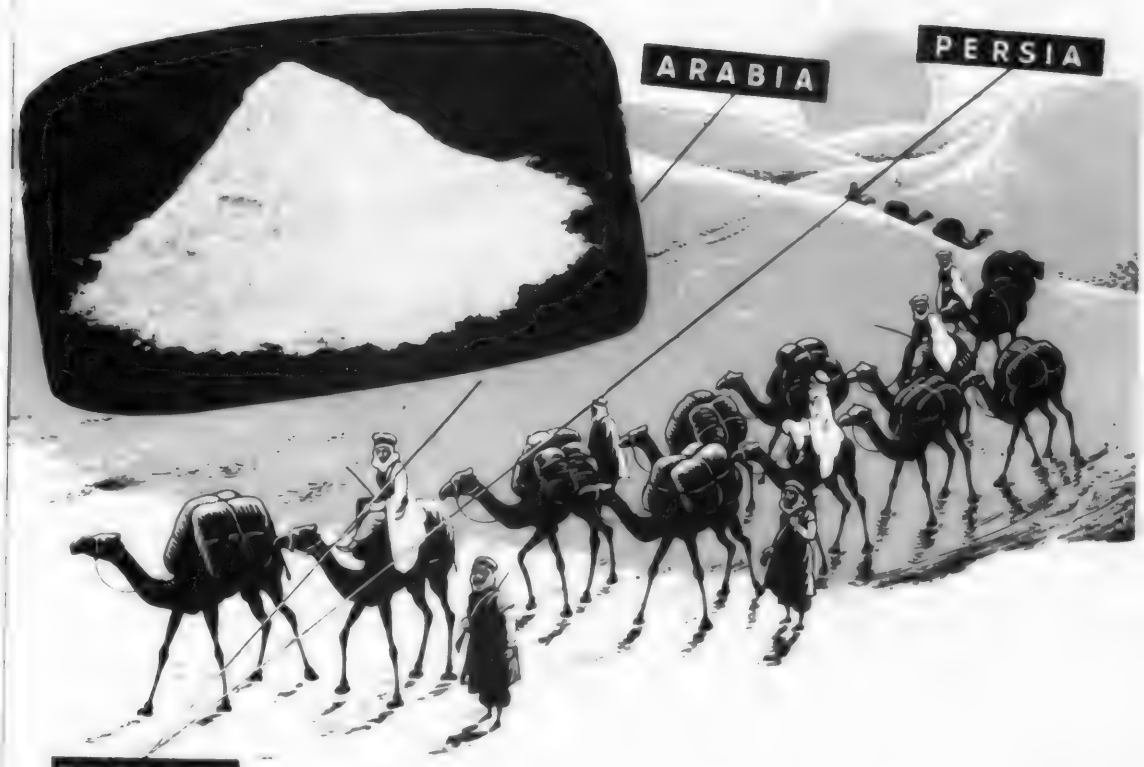

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No DEVIATION FROM ACCEPTED STANDARDS OF MUCILAGE . . .

All grades natural and powdered.

Over 80 years' experience entitles us to claim exceptional ability to answer any questions that may arise in the use of gums.

Strict technical control.

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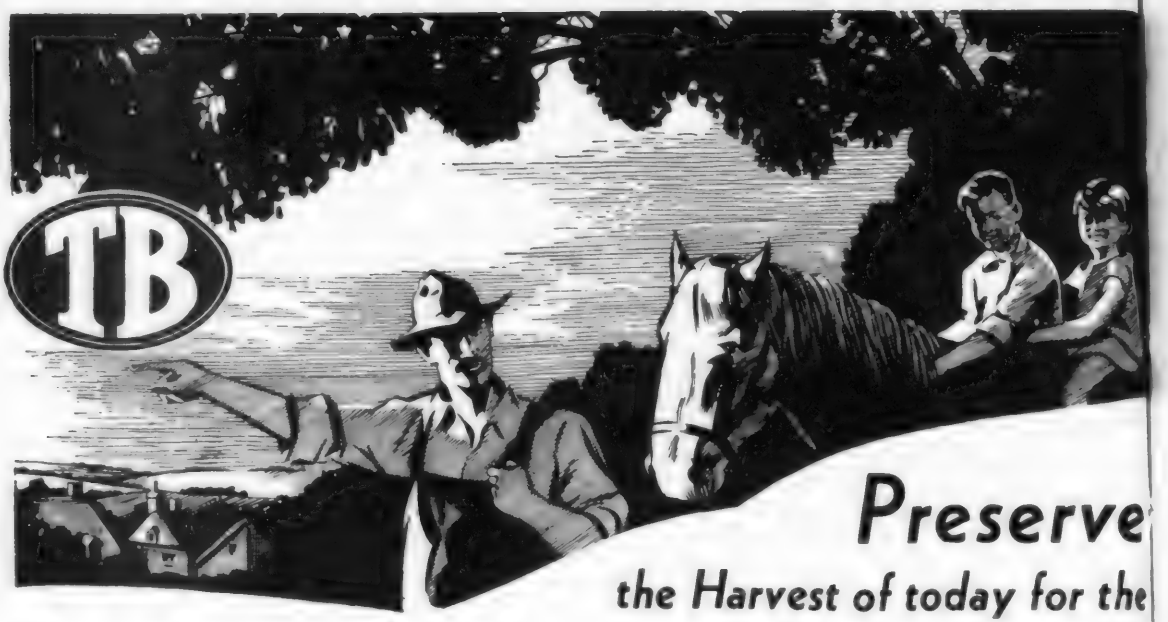

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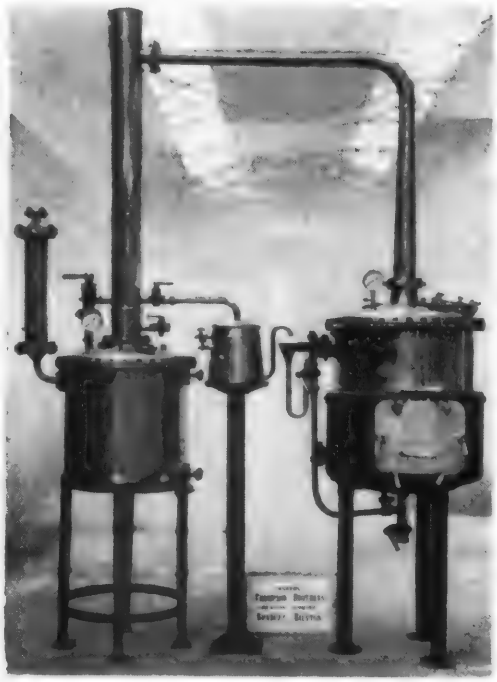
the Harvest of today for the needs of tomorrow—



Successful food-processing demands the right equipment.

T. B. Equipment, specially designed for the Food Industry, is the outcome of specialisation based on an intimate knowledge of its requirements.

The 60 gallon Still, Condenser and Receiver shown on the left, and the shallow type Jacketed pan below, are typical examples.

Whatever your requirements, consult us. Our experience of over 50 years is at your service.

THOMPSON BROTHERS (BILSTON) LTD

BRADLEY ENGINEERING WORKS · BILSTON · STAFFS · Telephone: BILSTON 41264/8 Telegrams: THOMPBROS, BILSTON

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BULMER'S FIRMAJEL PECTIN..

GOES INTO THE FINEST JAMS

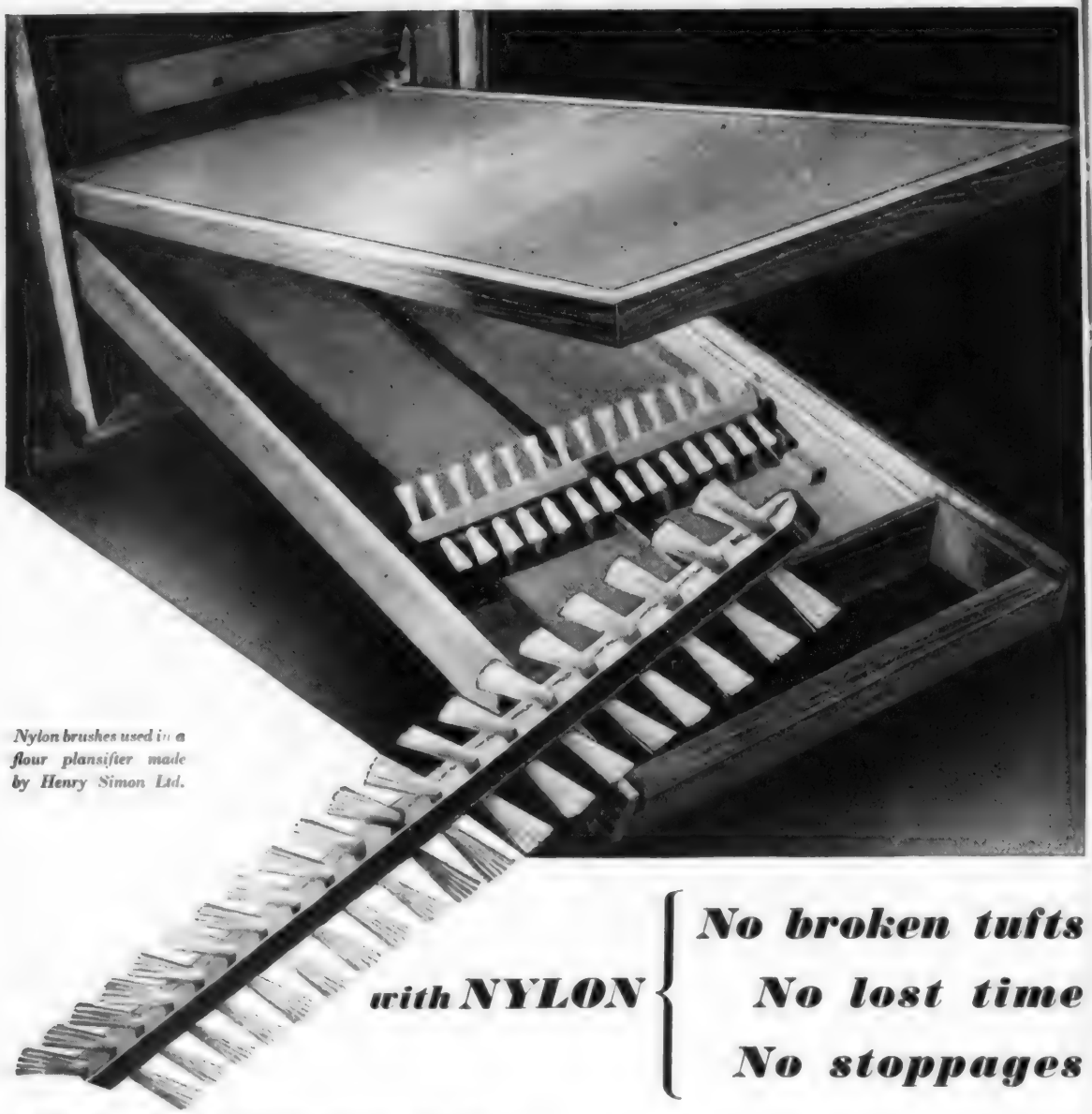
CONSISTENT QUALITY • PALE COLOUR • QUICK REGULAR SETTING POWER

Bulmer's offer tanker delivery to large users within reach of the bulk stores at Hereford, London and Manchester. Pectin piped to the boiling pan from factory storage tanks saves space, labour and handling costs.

Bulmer's Firmajel in cask is delivered by road service over a wide area of England.

Bulmer's Firmajel free from preservative supplied in tins containing 40 lbs. Convenient for small users and for makers of fresh fruit standard jams and jams for export.

H. P. BULMER & CO. LTD., HEREFORD · And at LONDON and MANCHESTER



Nylon brushes used in a flour plansifter made by Henry Simon Ltd.

with* NYLON** { ***No broken tufts
No lost time
No stoppages

The durable nylon monofilament tufts are resilient to abrasion and constant flexing, they retain their characteristics over a wide temperature range and they are unaffected by modern detergents.

Nylon monofilament has proved its suitability in many food processes, including flour milling, bread making, confectionery, brewing and bottle washing.

Whenever a brush is needed, a nylon brush is best

Nylon monofilament, a product of Imperial Chemical Industries Ltd., is now freely available to all brush manufacturers.

ICI

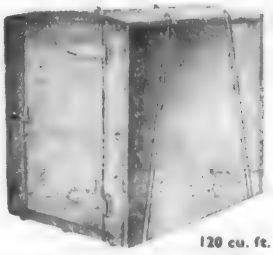
P.N.75

Mobile cold room!

The FRIGMOBILE insulated van body or trailer is designed for the conveyance of foodstuffs under conditions of perfect hygiene and correct temperature. They can be built to any size, or payload capacity, and to maintain temperature conditions suitable to the nature of the goods carried.

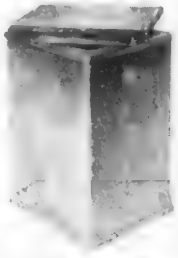
The FRIGMOBILE, either van or container, can be fitted with bunkers for use of solid CO_2 or with eutectic hold-over plates including all connections for charging from static refrigerating plants. Alternatively mechanically or electrically driven plant may be incorporated in the containers, thus rendering them a completely independent unit.

Designs have been standardised with Leyland Motors Ltd. for bodies to fit their Hippo and Comet chassis and with Dyson Trailers.

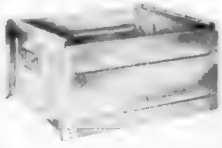


120 cu. ft.

"FRIGmobile"
REFRIGERATING CONTAINER
for Road, Rail and Water



2·8 CU. FT. CAPACITY
INSULATED CONTAINER
Outside Dimensions
17" x 20" x 31" high



'MORRICRATE'
Overall Dimensions
LENGTH 19⅝"
WIDTH 14⅞"
HEIGHT 9¼"

"FRIGmobile"
REFRIGERATING CONTAINERS

The FRIGMOBILE container is constructed all through of marine-type light alloys tight-riveted with all joints sealed waterproof. Tare-weight is reduced to a minimum allowing the maximum payload. Highly resistant to corrosion and absorption. Cleaned with soft or soapy water.

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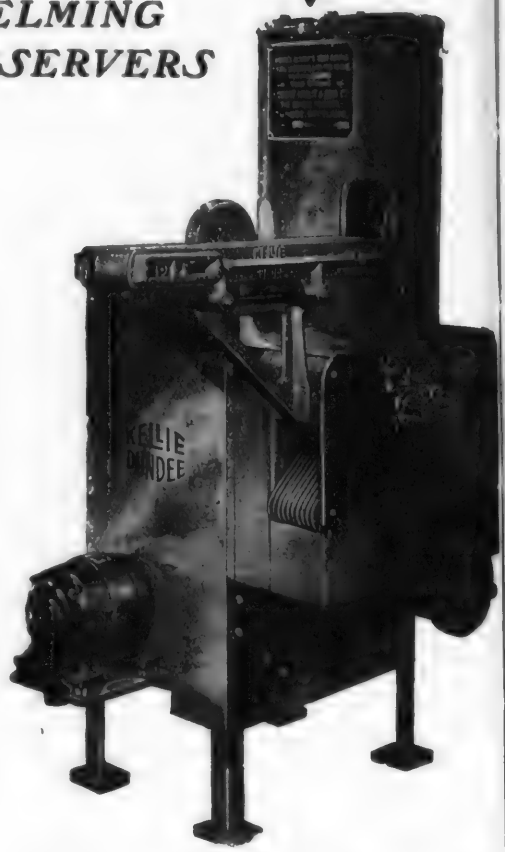

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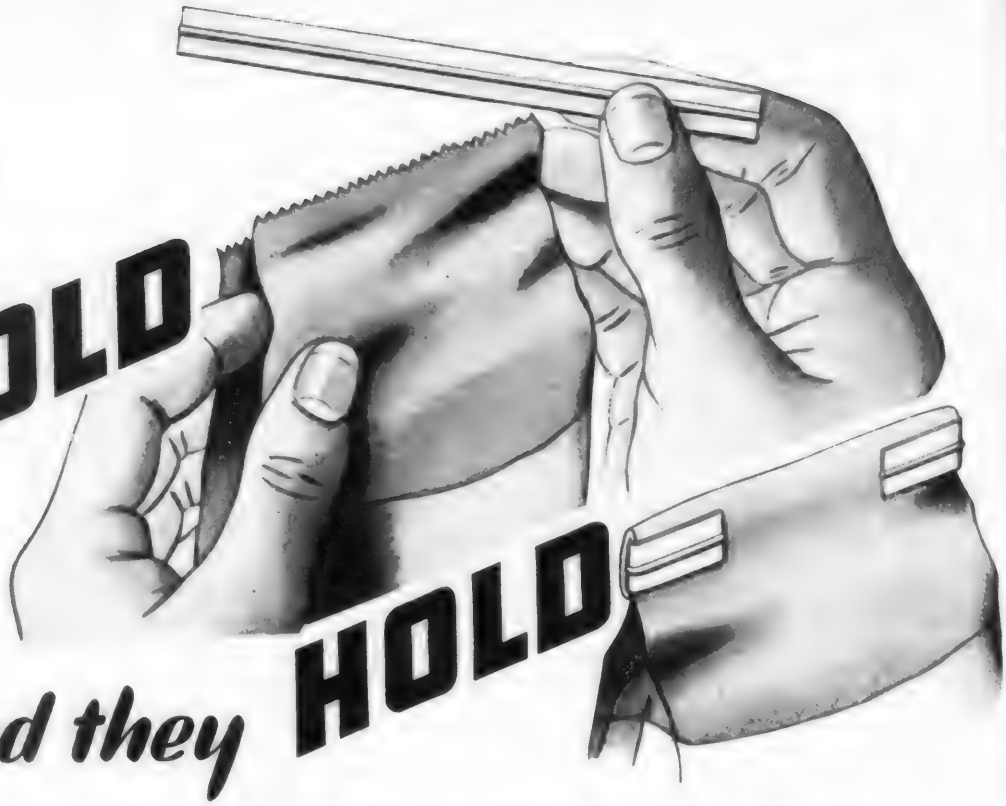

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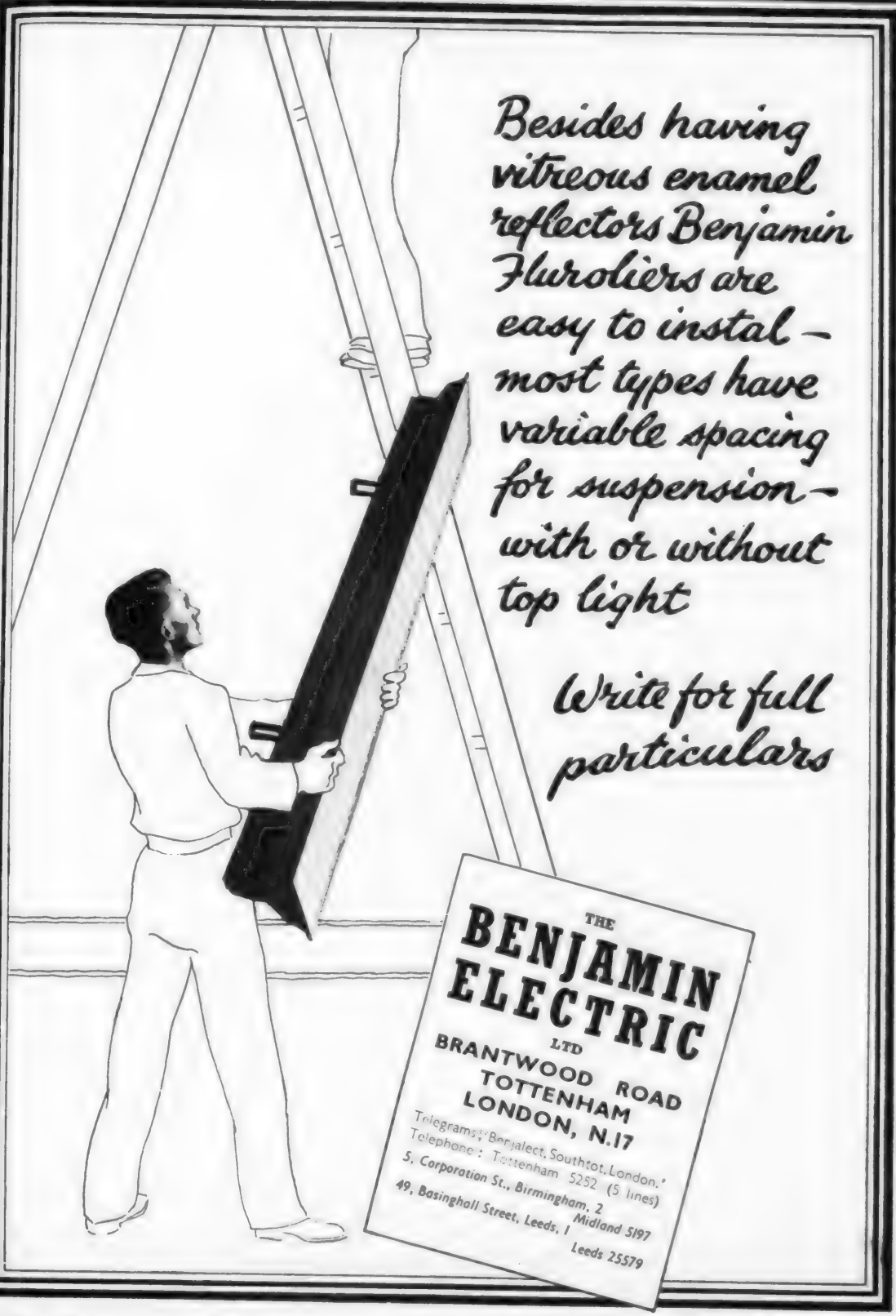
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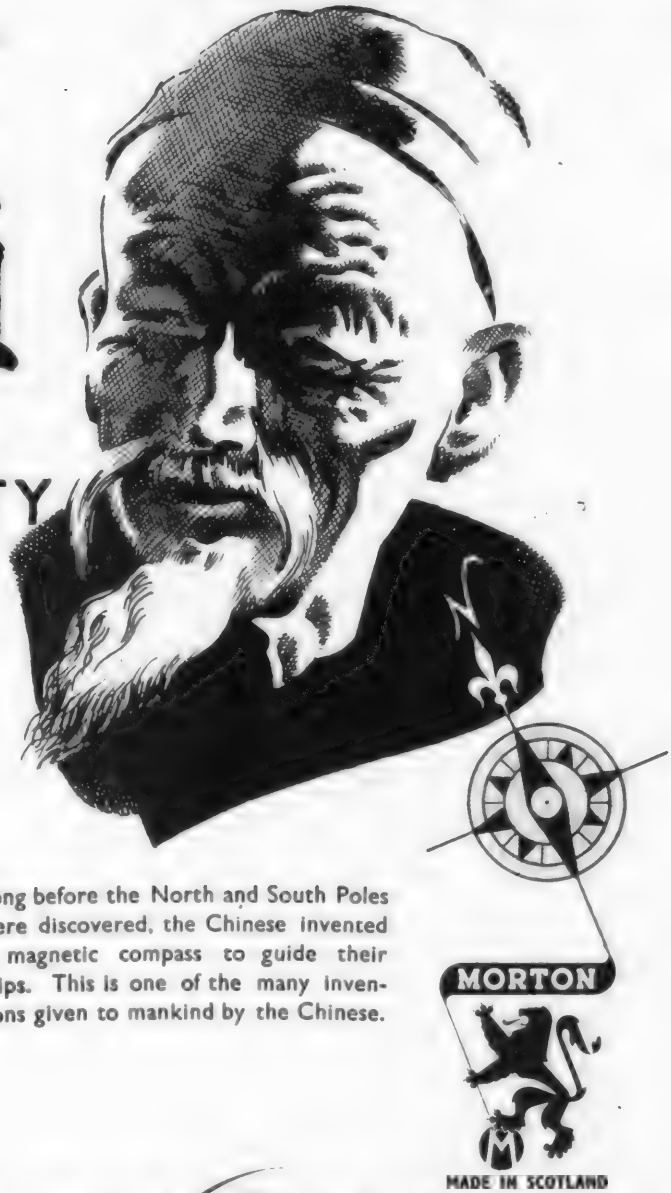

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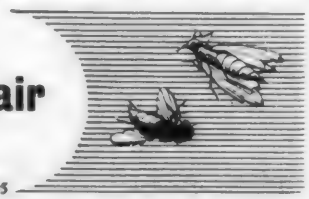

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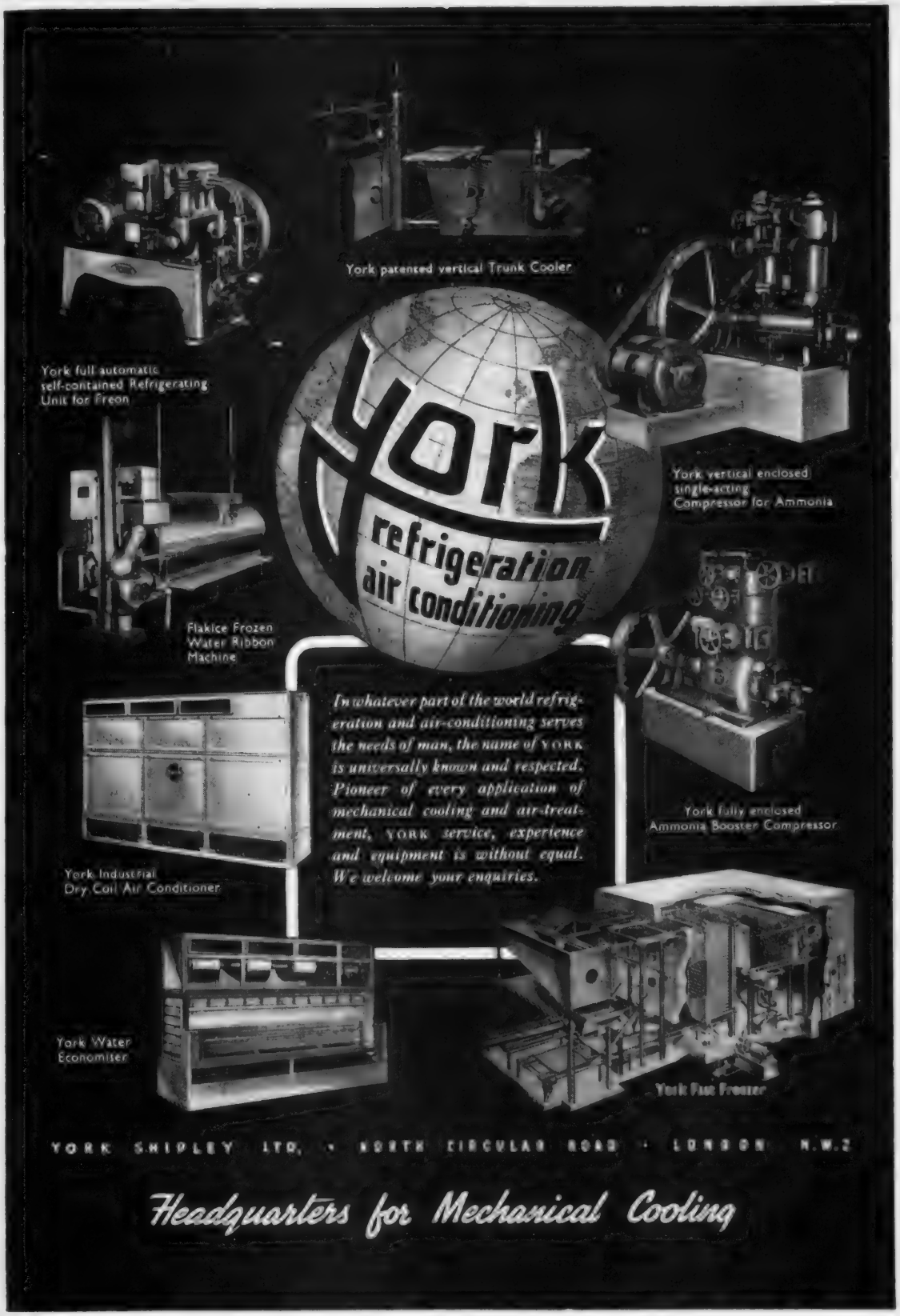
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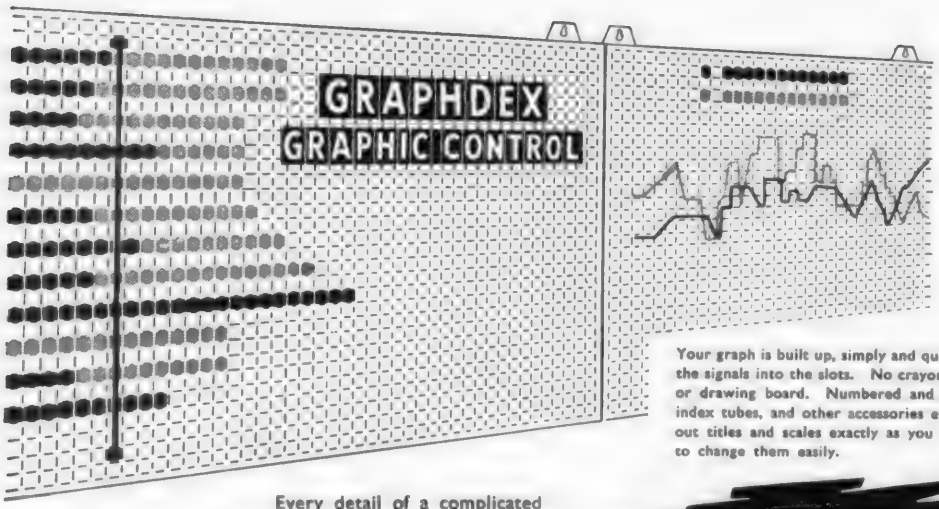

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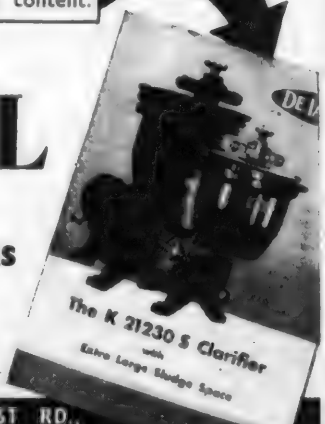

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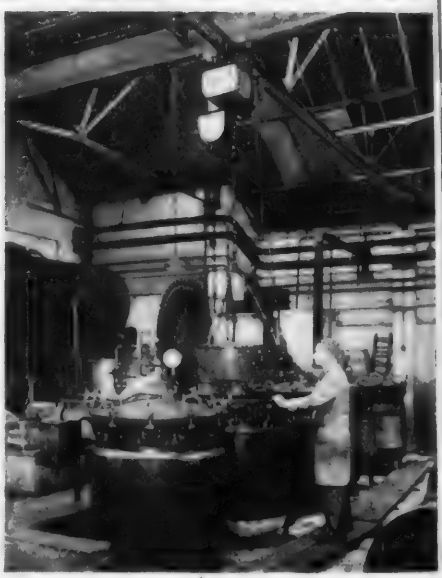

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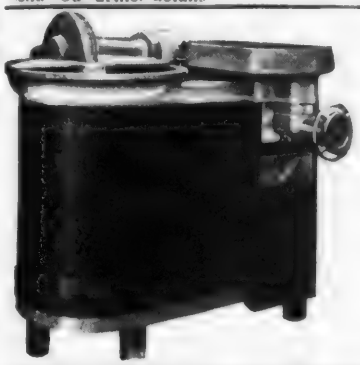

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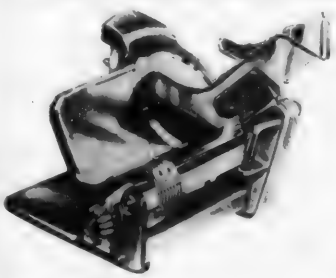

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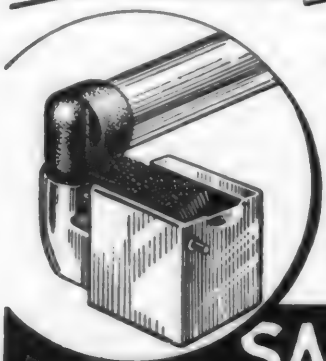

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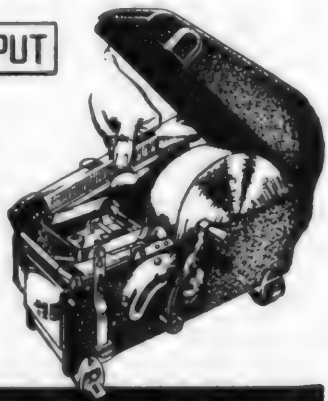

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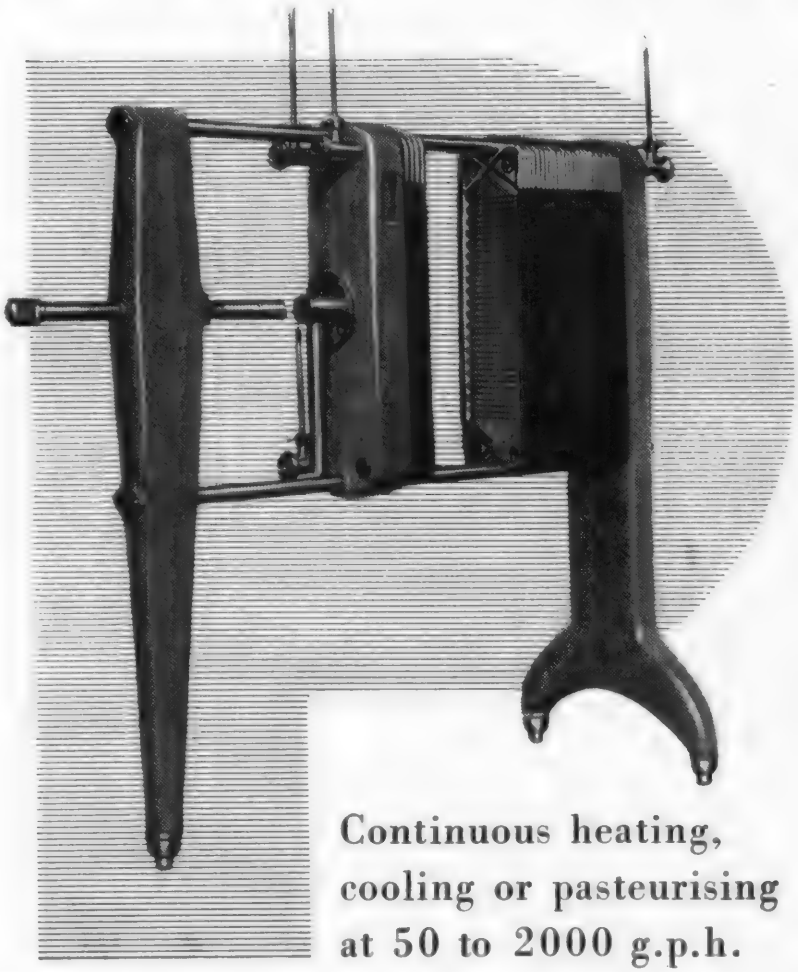

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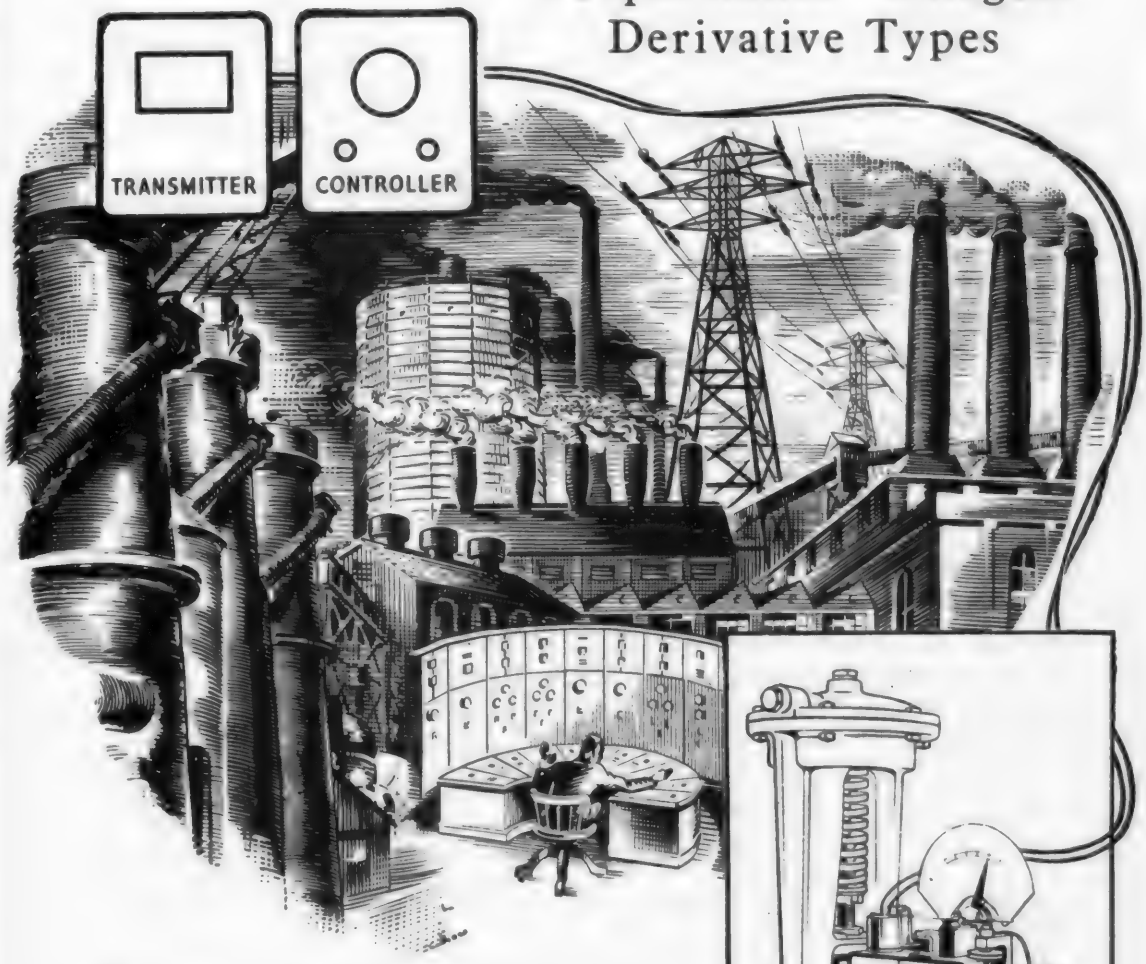

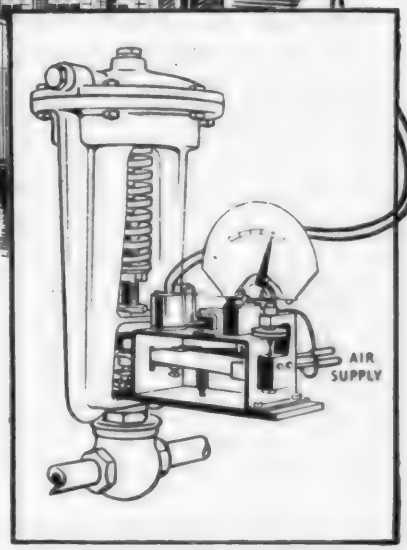

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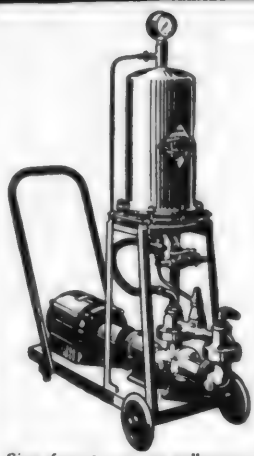

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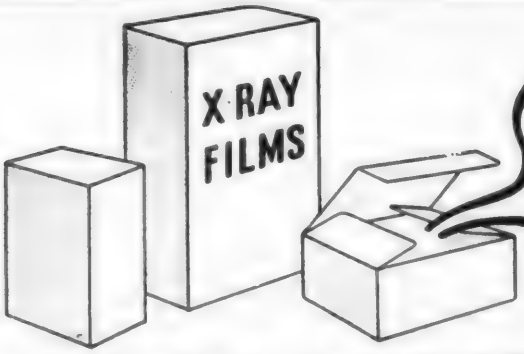

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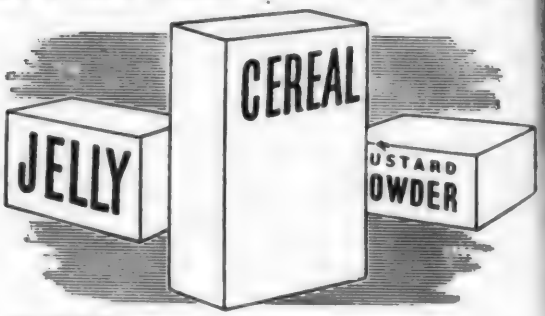

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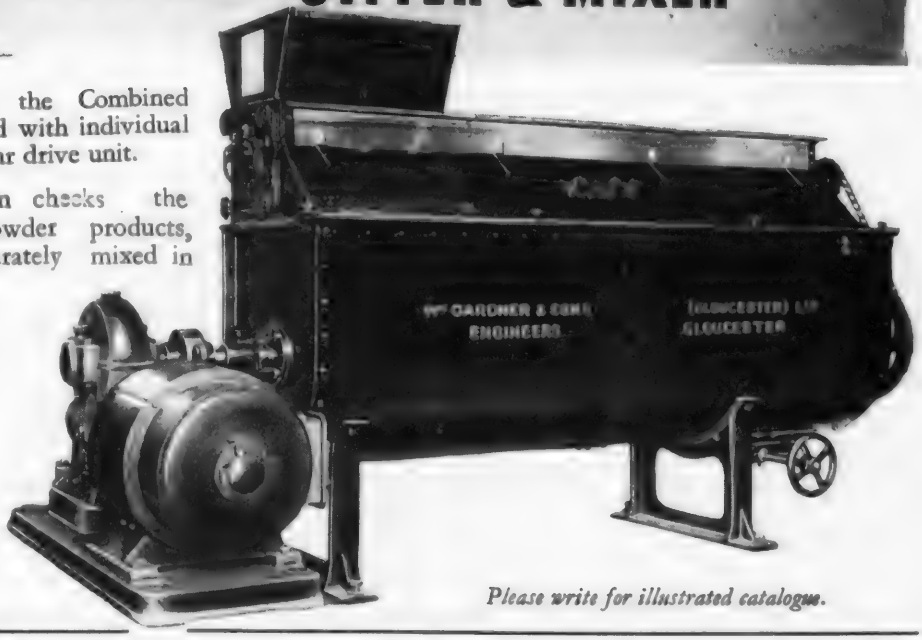

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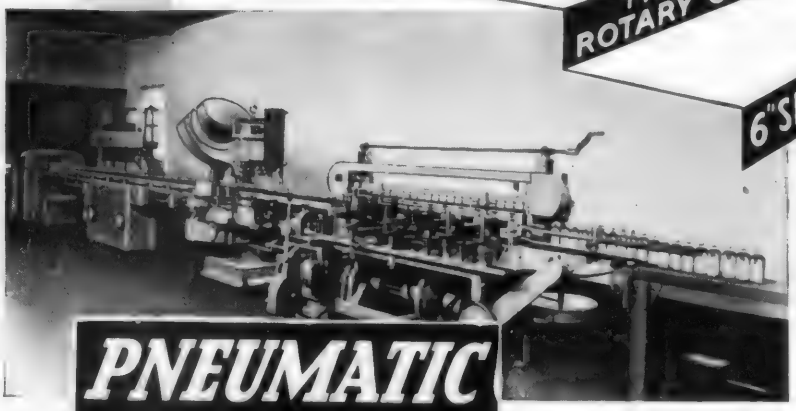

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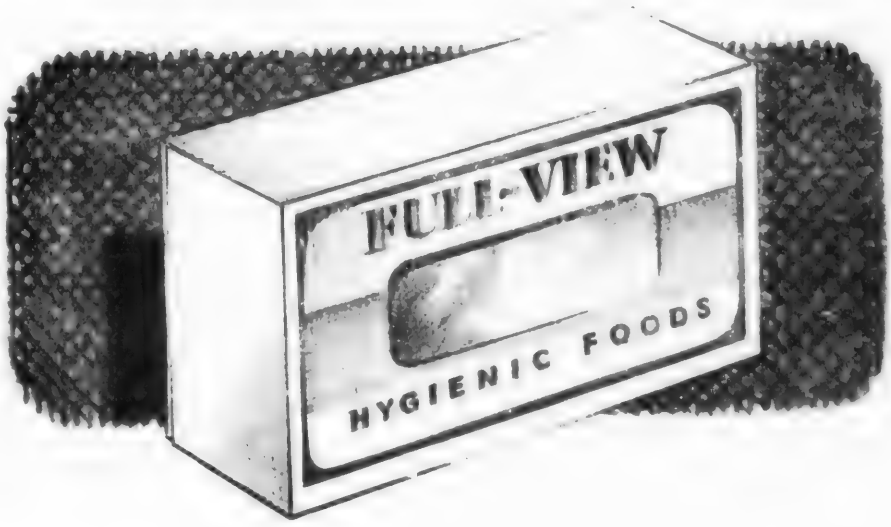
for FOOD



Cartons with transparent film windows which give the customer a view of their contents have been produced in this country for some time. The windows have been fixed slowly and laboriously by hand and as a result the cost of the package has been unnecessarily high. The Metal Box Company has now installed machinery for the automatic affixing of the film, which allows them to offer window cartons at a reasonable cost. Every Metal Box container aims to be the ideal package for the product which it contains.

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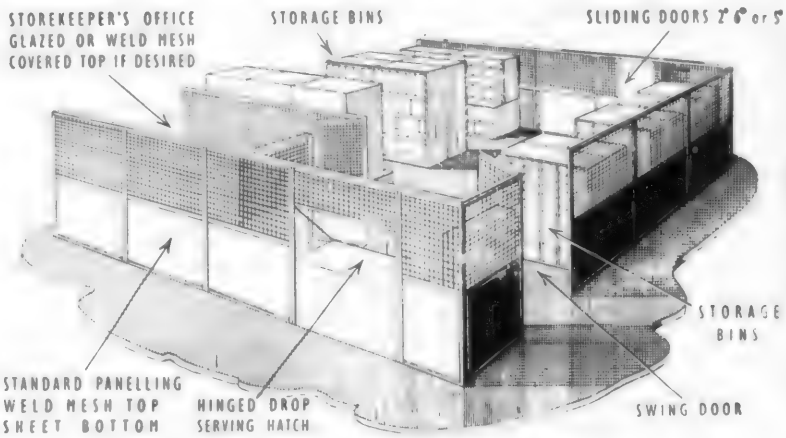
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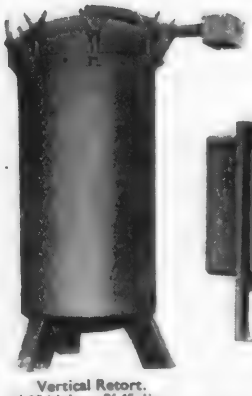

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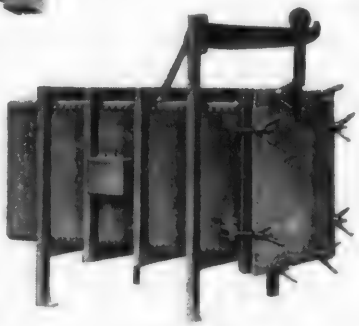

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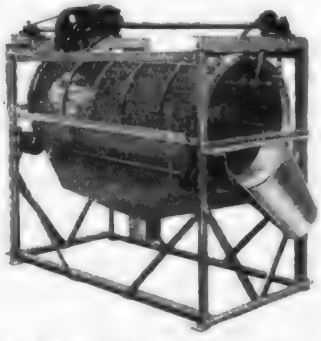
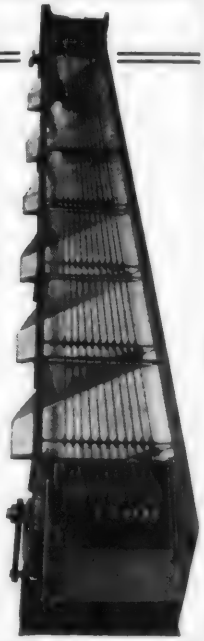


Rod Washer with friction drive and stainless steel rods. 2' 6" dia. × 5' 0".



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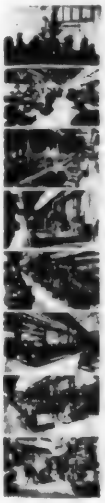

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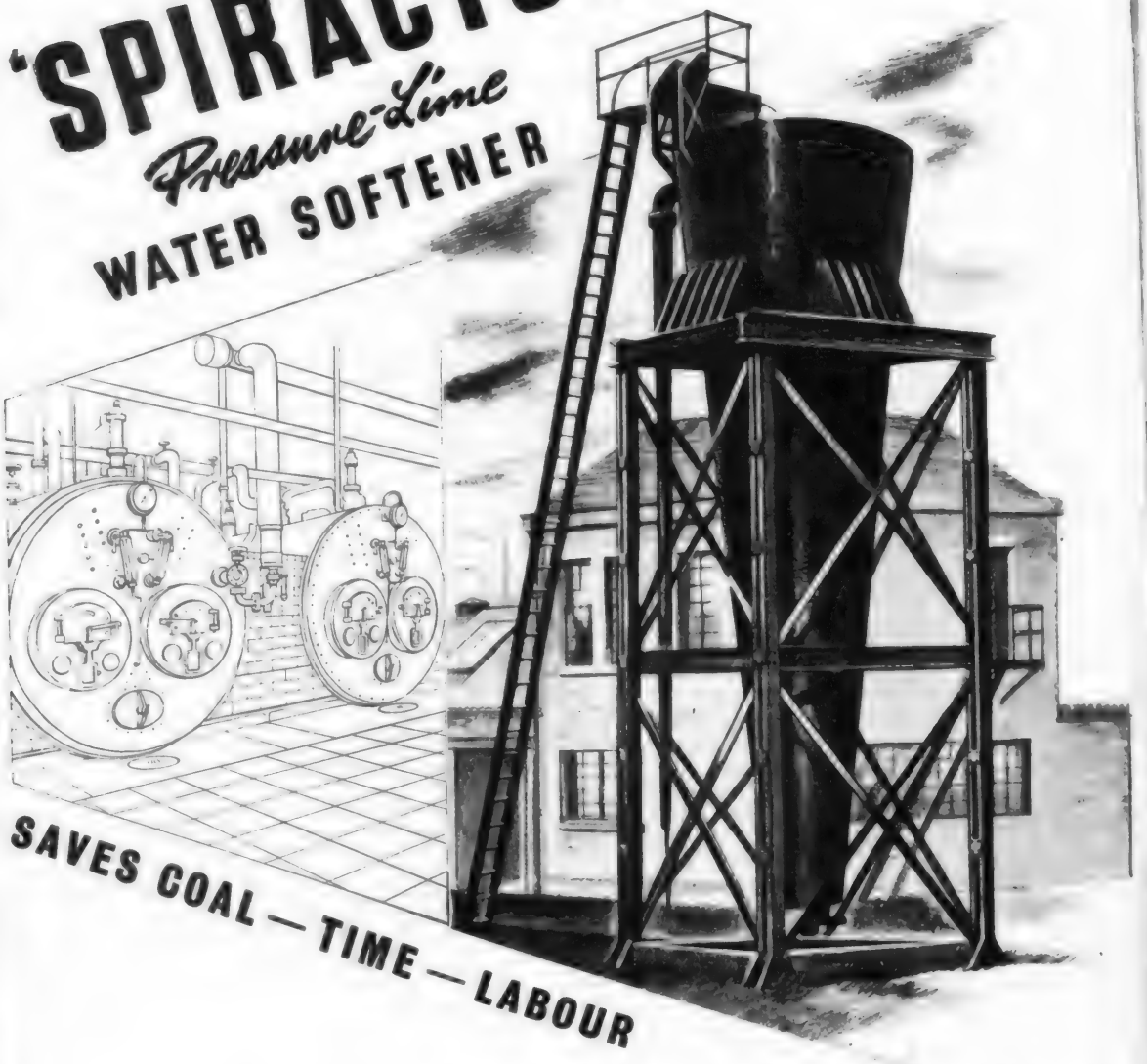

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FOOD MANUFACTURE

Vol. XXIV. No. 1 · Published Monthly · January 1, 1949

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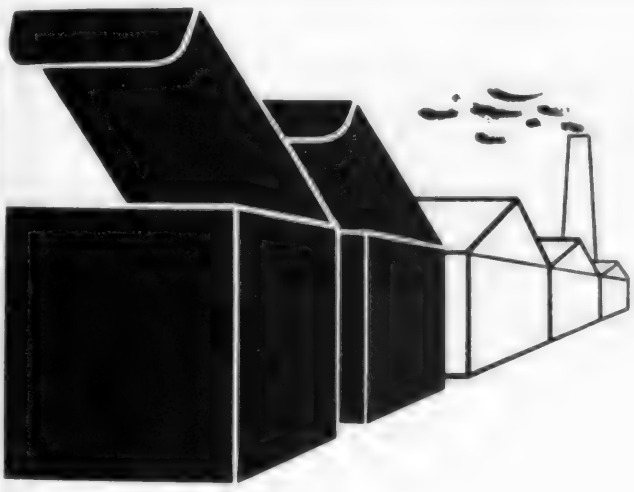

Britain's leading carton and box-making factory, brand new and fighting fit, enters the race for production after two years of preparation and planning. With new modern plant, and backed by generations of experience, this big addition to our capacity is designed for finest quality, fastest output and lowest cost.

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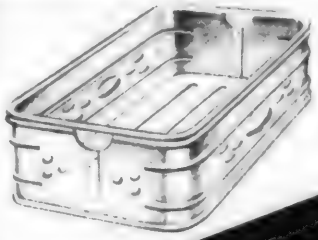
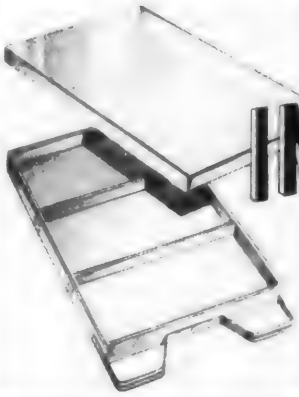


FOOD CONTAINERS IN ALUMINIUM ALLOY



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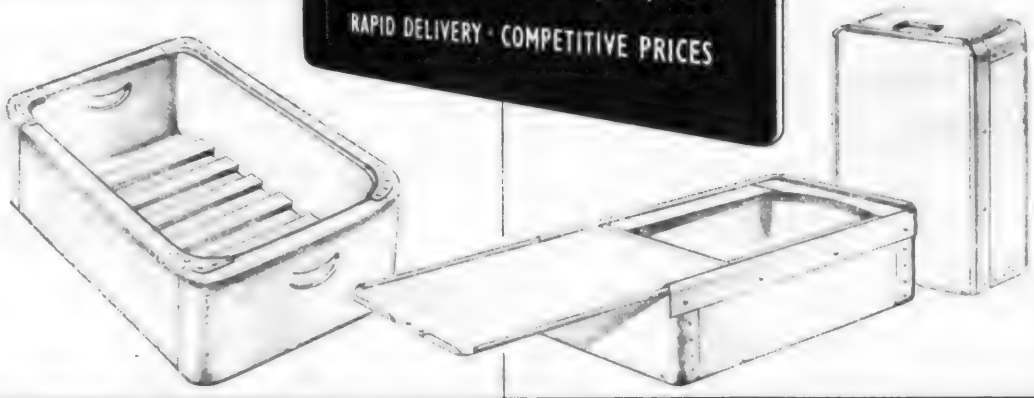

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FOOD MANUFACTURE

Vol. XXIV, No. 1 **January 1, 1949**

The Stars Foretell

THE new moon forming a conjunction with Jupiter indicates "heartening news in connection with food and the cost of living, increased supplies of food both at home and abroad with bigger rations to come . . ." according to Old Moore's Almanack for 1949.

Behold the scales of nineteen-forty-nine
Tipped heavily by influence benign
With basic foods; lo! a new moon conspires
With Jupiter to stoke the internal fires.
Ring out the old with all its uncashed points,
Ring in the new with larger, juicier joints,
With chunks of cheese, with lavish cuts of ham,
Sweet biscuits and some fresh, undollared spam,
While easier prices cause a happy swell
In purses as in waistlines. Well, well, well . . .
Let's hope Old Moore has got a private line
On auguries both human and divine!

The Agricultural Marketing Bill

It had been generally expected that the Agricultural Marketing Bill, presented in the House of Commons by Mr. Tom Williams, would deal with the recommendations of the Lucas Committee in regard to Commodity Councils for agricultural products for which farmers enjoy guaranteed prices. But the Bill does nothing of the sort. It does a good deal to bring the Marketing Acts of 1931 and 1933, and the schemes launched under them, more into line with post-war thoughts; but it contains no drastic proposals. A welcome revision deals with the "courts" in which marketing boards have acted as both prosecutor and judge in cases against registered producers. The "court" of the Milk Marketing Board was once described as another "Star Chamber," although the penalties it imposed were often nothing more than the sums of which the milk pool had been deprived by the irregularities under examination. The Bill provides that these "disciplinary committees," as they are to be called, must be presided over by an independent chairman with legal experience and approved by the Minister of Agriculture.

Marketing boards may have from eight to twenty-four members and the Minister will appoint not less than two nor more than one-fifth of the number. The Minister is empowered to give directions to a board if he believes that an act or omission of a board is against the public interest.

The Bill widens the application of the 1931 Act to certain derivative products, wool being specifically mentioned; but Part 2 of the 1933 Act, which provides for development schemes for organising the production of secondary agricultural products, is to be repealed. The Market Supply Committee under the 1933 Act is also abolished.

The Minister, after consulting existing marketing boards, will issue orders to bring them into line with the present measure. This section of the Bill (Clause 16) gives the Minister power to amend also the marketing schemes now in abeyance, such as the potatoes, pigs, bacon, and milk products schemes. No light is shed to indicate when these schemes may come out of cold storage. The Marketing Acts are extended to Northern Ireland but a scheme may not be made for Northern Ireland alone.

Bringing Home the Bacon

Home production of bacon during 1949 is expected to total not less than 100,000 tons, compared with about 61,880 tons in 1947 and an estimated output of 74,000 tons in 1948. The average annual pre-war output was about 156,000 tons, and a production of more than 100,000 tons was reached in each of the three years from 1944 to 1946 inclusive.

The expected recovery in bacon production during 1949 (due to the increasing pig population) does not foreshadow an end of the meagre ration of recent years. An annual output of 100,000 tons is not sufficient to maintain a weekly ration of 1 oz. It represents a weekly output of only 1,923 tons, and an average of 4,120 tons was

THE EDITOR SENDS SEASONAL GREETINGS TO ALL READERS

required every week from February to October to maintain the ration at 2 oz. weekly.

Denmark is expected to send 70,000 tons of bacon to Britain in 1949, against 25,000 tons in 1948. In spite of this expansion, however, it is unlikely that the weekly ration will rise above 2 oz. during 1949 as the Canadian contract is for only 72,000 tons, against 81,000 tons delivered in 1948.

Before the war the average weekly consumption of home-produced pig meat in Britain was 3,860 tons of pork and 3,830 tons of bacon. During 1948 consumption of home-produced pork averaged little more than 300 tons weekly—about one-sixth of the home production of bacon. The Ministry of Food proposes to continue to use the great bulk of the home-produced pigs for curing purposes.

The maximum potential output of bacon in Great Britain has been officially stated to be between 150,000 tons and 200,000 tons a year. It is believed that the Ministry is more eager to see the bacon factories working close to capacity than to restore the fresh pork market to its pre-war dimensions, important though the latter task undoubtedly is.

A Snook at Snoek

There was a man who asked to have explained to him the difference between poetry and prose. He expressed considerable surprise at the answer and marvelled at the fact that he had been talking prose all his life without knowing it. We were reminded of this old story on reading that the honourable Members of the House of Commons had been innocently eating snoek in their dining-rooms for weeks. Cabinet Ministers, M.P.s, and newspapermen all seemed to like it, according to Major S. A. Sidwell, manager of the House of Commons catering department.

It is a pity about snoek. When it was first introduced, the Ministry of Food protested too much and the "law of reversed effect" postulated by the late lamented Coué came into operation. We tasted it at Portman Court and wondered why it should have been necessary to doll it up so much with ancillary substances.

Its *débâcle* has been due partly to a bad press and partly to its ugly name. The psychologists at the Ministry of Food should have tried to find a more attractive one. In Chile they call it *sierra*; another name for it is *barracouta*, and a still more attractive name is *robalo*. An alternative would have been a "fancy" name. Private enterprise does it: for instance, "Pom" for mashed potato powder. *Verb. sap.*

More about Cracked Cups

In the House recently doctors and laymen thrashed out the question of the dangers or otherwise of chipped and cracked crockery used in catering establishments. On the medical side Dr. Barnett Stross who, like Agag of old, "came delicately" to the discussion, said: "It appears that reasonable cleansing with boiling water of an unbroken surface will leave only a few *Streptococcus albus*, whereas on cracked crockery there can be found many other types of organisms, particularly haemolytic streptococci."

During the proceedings up spake the inevitable sceptic, who little recks of the disciplines and rigours of the laboratory. Tests were bunk—or words to that effect. That was Mr. John Lewis, who also suggested that the hon. gentlemen might be just as interested in the pottery industry in their constituencies as in the subject under discussion!

Dr. Summerskill, in her reply, said she was very glad that Dr. Stross had been so moderate, as it was important not to frighten the people. As if they were not conditioned by reiterated warnings of the gruesome effects of the atomic bomb and the dangers of the highways! That notorious "widow" poster did not prevent them from getting themselves killed by the thousand.

According to Dr. Summerskill's authorities, there is no record of serious illness which has been traced to the use of cracked crockery. She said that the cases of food poisoning which occurred all over the country were due to the multiplication of organisms in the food. But these things are usually local and the cause rapidly ascertained. We cannot subscribe to the complacency apparent in many of the opinions expressed in this discussion. Sore throat may be due to minor causes or it may not be, but the fact remains that it is very general, although probably most of the cases are not seen by the doctors. We hardly ever sally forth into the highways and byways without meeting someone with a sore throat. For ourselves we object to feeling that we may be harbouring even a few colonies of streptococci in our heads!

It is an anomaly that, although in our food factories in general meticulous methods are used to ensure absolute cleanliness, we are often obliged to eat the food from dirty vessels served by people with dirty hands.

A course of action unknown to most people was mentioned by Dr. Summerskill. Any individual can report the manager of a catering establishment who is conducting it in dirty

fashion. But how many people have the time and energy to take action or even walk out of a place when, as so often happens, he is offered food on a dirty plate. Apart from that, the word "informer" offends most British ears.

However, the Parliamentary Secretary to the Ministry of Food told the House that they feel so seriously about the matter that a catering trade working party is being set up to secure "sanitary and cleanly conditions in the catering trade," and we are pleased to note that the chairman is to be Sir William Savage, supported by a whole host of experts and members of the trade itself. It may be that we may thereby be absolved from exceeding the proverbial ration of a peck o' dirt in our lifetime.

How Much Fat do we Need?

In a letter to the *Lancet* Dr. A. R. P. Walker shows a certain scepticism about previous pronouncements on the effects of fat on the diet. The high fat intake of the American people is considered by one authority to be one of the factors responsible for their display of confidence. In this country, the reduced fat intake of the community is now alleged to be one of the causes of its present tiredness and proneness to fatigue. Dr. Walker attempts to examine the evidence. The average daily fat intake during the war years was reported to be about 80 to 100 g.; at present it is stated to be about 60 g. The first question (says Dr. Walker) is whether other war-affected communities consuming a reasonably adequate diet with a similar or lower fat intake display the same symptoms. He cites different countries where the fat intake is very low, but where the inhabitants are in good nutritional condition. He therefore concludes that it is unjustifiable to define the deficiency symptoms of a nutrient whose minimum requirement is not yet established.

Dr. Leitner later takes up some of Dr. Walker's points. He stresses the importance of non-caloric functions of fat and states that in a properly balanced diet the absorption of the fat-soluble vitamins and of calcium and phosphorus depends on adequate fat intake. Dr. Walker agrees, but questions whether the improvement is of quantitative significance. He quotes Drummond, who contends that there is no indication from wartime records that subsistence on diets poor in fat accelerates the appearance of a deficiency or aggravates it. He also cites other authorities who have arrived at the same conclusion. With Dr. Leitner's point that one of the advantages of an adequate fat intake is its sparing action on the B vitamins Dr. Walker agrees, but (quoting Elvehjem and Grehl) says that it may actually increase the requirements of other members.

Another property of fat, Dr. Leitner states, is that it confers great efficiency in the utilisation of food energy and secures extra calories for work, growth, and storage. Dr. Walker again raises the quantitative aspect. He admitted that sufficient recognition may not always be accorded to the non-caloric functions of fat, but in practical nutrition it was seen that the benefits to be derived are very limited.

In reply to Dr. Leitner's reference to the conclusion of Burr and Barnes that there are ample reasons for recommending that the fat intake be not reduced below the normal established by habit, Dr. Walker contends that there was no mention of the fate of groups of persons or of communities who had suffered from having had their fat intake reduced. In the present state of knowledge there does not seem to be any conclusive evidence that diets low in fat are injurious to man; it is hardly necessary to add, however, that such diets are neither approved nor advocated.

American v. *Imperial Gallon*

Lack of world uniformity of measures has presented international commerce and industry with various complicated problems. This is illustrated by an unfortunate situation which has arisen in South Africa owing to the difference between the Imperial gallon, the recognised legal measure in South Africa and Britain, and the American gallon—160 against 133 British fluid ounces. The Union's Weights and Measures Act and Regulations require that cans or bottles of certain imported liquids be labelled to state the equivalent in legal Union measure, as, for example, "One American gallon, the equivalent of three quarts and thirteen Imperial fluid ounces." The wide majority of consumers, however, does not stop to realise that there are forty fluid ounces in a quart and that there are, therefore, twenty-seven fewer Imperial fluid ounces in the American gallon than in the Imperial gallon. They are influenced completely by the price and buy what is apparently the cheaper article. Unfortunately, the South African law does not permit the expression of the difference in a more easily understandable form, such as 5/6th or ·833 of an Imperial gallon, and manufacturers have been so severely affected that, to compete with United States pro-

ducts, many of them have actually been considering abandoning Union measure containers in favour of American sizes.

At the request of organised commerce and industry in South Africa, a special exploratory committee has been set up by the Bureau of Standards Committee to investigate the situation, and the reaction of those concerned throughout the Union is now being sought to a proposal that, after a period of, say, fifteen months, all imported liquids be packed and marked in legal Union measure only.

Strong opinions are also held on the undesirability of the system under which it is legal to mark liquid containers " small," " medium," or " large " without stating the actual contents. It is felt by many that the law on this point should be tightened and comment is being sought on a proposal to discontinue the system.

A good deal of consideration was given to the matter before the proposal to enforce the use of Union measures was put forward, and if the replies received from those concerned indicate that the advantages of an alteration in the law would outweigh the possible disadvantages, the Government will be asked to legislate to give effect to the recommendation.

Research Receives a Helping Hand

Stressing the importance of Research Associations in preventing Britain dropping back into the position of a third-rate power, the Right Hon. Herbert Morrison, M.P., Lord President of the Council, in an address to the chairmen of councils and the directors of the Industrial Co-operative Research Associations, said that all our hopes today for the future strength and even the independence of our country depended on increasing productivity.

He spoke of the Government policy to encourage the establishment of Research Associations and of the general rise in their expenditure. In 1938 the total expenditure of Research Associations was £470,000, in 1947 it was close on £2 millions, and the total estimated for this year was £2½ millions, but this did not cause alarm so long as the cost of research more than earned its keep.

Many examples of increases in productivity from research were quoted, from ceramics to the surface dressing of roads, and the time was not far distant, said Mr. Morrison, when scientific research would be recognised as the most central and important of all the processes of production. Facilities for research were not always available, shortage of buildings and equipment hampered much progress, but as a result of a recent Government survey it had been decided that a larger share of building resources must be made available for the equipment of research and other institutions likely to contribute to raising the productivity of industry.

The Nigger in the Pressure Cooker

The trouble started in *The Times* correspondence columns. First a letter in praise of domestic pressure cooking promptly followed by one from a doctor in a maternity home, who said that " it appears that about half the aneurin (vitamin B_2) is lost under the usual working conditions in a pressure cooker—a much greater loss than when cooking in a saucepan." This caused us to make a search in the literature, and we had that unfortunately not rare feeling of frustration which is the result of drawing a blank.

However, after a few days another letter appeared which told us what we wanted. Dr. John Yudkin, Professor of Physiology at King's College of Household and Social Science, was also doubtful about the evidence, and stated that the published data on the effect of pressure cooking upon nutritive values were extremely scanty, and he knew of none referring to aneurin. In fact, according to the experiments he had conducted, it had been shown that, as is the case with vitamin C, there is less loss of aneurin in pressure cooking than in cooking in a saucepan.

Professor Yudkin rightly points out that the advantages of pressure cooking in the saving of time, and especially in the saving of fuel, are so great that it would be a pity if anyone were to be deterred from using this procedure by a misapprehension regarding its effect on the nutritive value of food.

So much for the vitamin angle. We doubt whether this will give a thrill to the majority of housewives. We strongly approve of the pressure cooker for many cooking purposes, but we wonder what is the percentage of kitchens in which it is habitually used. The kitchen is the home of reaction, and those who cook are among the most conservative people in the world. Perhaps, in the future, owing to the lack of domestic help which bids fair to be permanent, a new race of cooks will evolve, and " domestic science " will be a subject in primary schools' curricula. In the meantime wild horses would not induce the typical occupant of the present-day kitchen to use what she terms " contraptions," or to clock-watch her operations—fuel or no fuel.

The cabbages arrive in net bags by lorry.

Vegetable Dehydration in Cornwall

Cornwall produces a rich selection of crops, with green vegetables taking the leading place. It is with this type of product that the vegetable drying factory of F.M.S. (Farm Products) Ltd., situated at Camborne, is principally concerned.

PREVIOUSLY operated by the Ministry of Food as one of several put up to meet wartime requirements, the company's most recent factory went into production at Camborne twelve months ago. It embodies the results of experience over a number of years and is a model of layout and good utilisation of space.

Raw materials are supplied by farmers within a radius of twenty miles or more. For cabbages and savoys the farmer is given a contract and so is assured of a set price for his crops before the seed is in the ground and a certain outlet in his own county for part of his produce; this helps to stabilise the position of the producer and to balance the ups-and-downs of the year's economy.

At the time of the visit of FOOD MANUFACTURE'S representative the factory was engaged in the dehydration of cabbages and savoys, and the equivalent of twenty tons a day of the dried product was being handled. The cabbages are bought under specification, the limits of weight being 3 lb. minimum and 12 lb. maximum.

An army of women hand trim the cabbages.

There are two main seasons, one during which the factory handles spring and summer cabbage, and the other when winter cabbages (savoys) are processed.

Arriving in net bags on lorries, the cabbages are unloaded without

After trimming, the cabbages are conveyed to the shredders.

delay and passed to the tables for hand trimming. An army of women removes the outer leaves, halves the cabbages, and cuts off stalks. The trimmed cabbages are then placed on a belt conveyor which takes them to the machines where they are cut into shreds.

Falling on to a moving belt, which takes them to the strip washer, they come under the scrutiny of an operative who eliminates any faulty material that might have remained after previous inspections. In the washer the pieces of cabbage are divested of any vestige of foreign matter.

Blanching Operation

Blanching is then carried out in a perforated cylinder which dips into an outer half-cylinder. This half-cylinder contains water in which is dissolved a small quantity of sodium sulphite. The water is heated by steam coils almost to boiling point and automatic control maintains the required temperature. The cut cabbages are propelled by means of a scroll and emerging fall on to a moving belt.

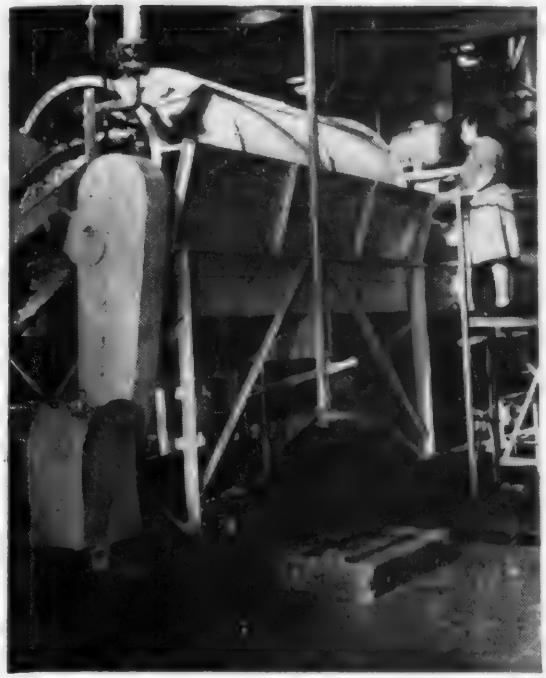
Samples are drawn from the blancher and subjected to the peroxidase test. The sulphite content is also checked.

The hot strips are next conveyed to the cooler in which they are subjected to blasts of cold air. From the cooler they fall on to wire mesh trays over which the strips are spread. These trays are loaded on trolleys which carry stacks of fifty trays each, and pass along a continuous roller to the air tunnels in which drying takes place. The trolleys first enter the wet tunnel by means of a transfer bogey operating beneath a quick-action door, which is immediately closed behind it. Automatic pusher gear is then brought into use and the train of six trolleys is moved forward by one trolley length, fan clutches are re-engaged, and the newly inserted load of raw vegetable is at once subjected to the air stream at its highest temperature point.

Inside the Drier

The path of the air through the drier commences at the discharge end, where it is raised to a moderate temperature by means of sealed steam heaters and passes over the trays in the trolleys standing in the second air tunnel. It is then led through by means of overhead ducting to the main series of steam heaters in the first tunnel, where the temperature is raised to its highest point and where it

Shredded cabbage is inspected before entering the washer.



In the strip washer the pieces of cabbage are divested of any foreign matter.

Samples are drawn from the blancher and subjected to the peroxidase test.

From the cooler the strips fall on wire mesh trays, over which they are spread.

Trolleys loaded with trays enter the wet tunnel by means of a transfer bogey.

The finished product is packed and weighed.

Photographs: Leonard Hill Ltd.

immediately impinges upon vegetable shreds in the raw state. The air then passes through the series of trolleys in the wet tunnel to the point where it is discharged to atmosphere. At this point a certain amount of the partially saturated air is drawn off for a second recirculation, thus giving control of the humidity in the main section of the drier. By careful adjustment of humidity, ideal drying is achieved and reasonably high temperatures may be applied without fear of scorching or burning the product. As drying proceeds in accordance with its set time cycle, the vegetable steadily gives off its moisture content, and at the same time is gradually moved away from the source of heat.

Drying Times

The tunnels are in series, with commencing temperatures high and final temperatures low. Normal drying time, worked on fixed intervals, varies between six and seven hours, and once temperatures have been stabilised an essential part of the process is to maintain them unchanged throughout the whole run. Trolleys containing the finished dried material are removed at times fixed to coincide with the insertion of fresh trolleys, and the product is unloaded from the trays and sent forward for packing.

Packing is in the form of metal boxes which are filled and sealed as soon after processing as possible. Each tin contains 5 lb. of dried cabbage which, when reconstituted, is equivalent to approximately 80 lb. of fresh vegetables. The air in the tins is replaced by nitrogen gas and the tins are packed two to a carton.

Potatoes are handled in much the same way as cabbages, except that they first enter a pre-washer and are then conveyed to a trimming table and thence by belt conveyor to the peeling machines where carborundum rollers remove the peel. They are then conveyed to the cutters and treated in the same way as cabbage. Carrots are also treated in much the same manner.

Careful laboratory control is exercised over the quality of the finished product. The dried strips are tested quantitatively for sulphite; colour, texture, and flavour are compared with standard samples.

SOME SUPPLIERS OF EQUIPMENT

Strip washer and trolleys: *S. Briggs and Co., Ltd.*
Blancher: *Mather and Platt, Ltd.*
Cooler: *Tomlinson and Co., Ltd.*
Automatic control: *Foxboro-Yoxall, Ltd.*
Boxes: *Bowaters Fibre Containers, Ltd.*
No-Nail Box Co., Ltd.
Tins: *The Metal Box Co., Ltd.*
A. Lloyd and Sons, Ltd.
Driers: *Andrew Machine Construction Co., Ltd.*
Gas apparatus: *John Fraser and Son, Ltd.*
Tunnel fans: *Matthews and Yates, Ltd.*
Tunnel pusher gear: *Dewhurst and Partner, Ltd.*

Air Sterilisation

THE second edition of a book* records some of the developments which have taken place in the use of aerosols, more particularly in their application for sterilisation, disinfection, insect control, and therapeutic purposes. A further development, dealing with the use of aerosols in inhalation therapy, is fully described in this latest edition, which summarises progress in all fields to date.

* *Aerosols in Theory and Practice.* By Archibald C. Lock, M.I.E.E., F.P.S. Pp. 59. London. Price 3s. 6d.

The Milling Industry

Progress in 1948

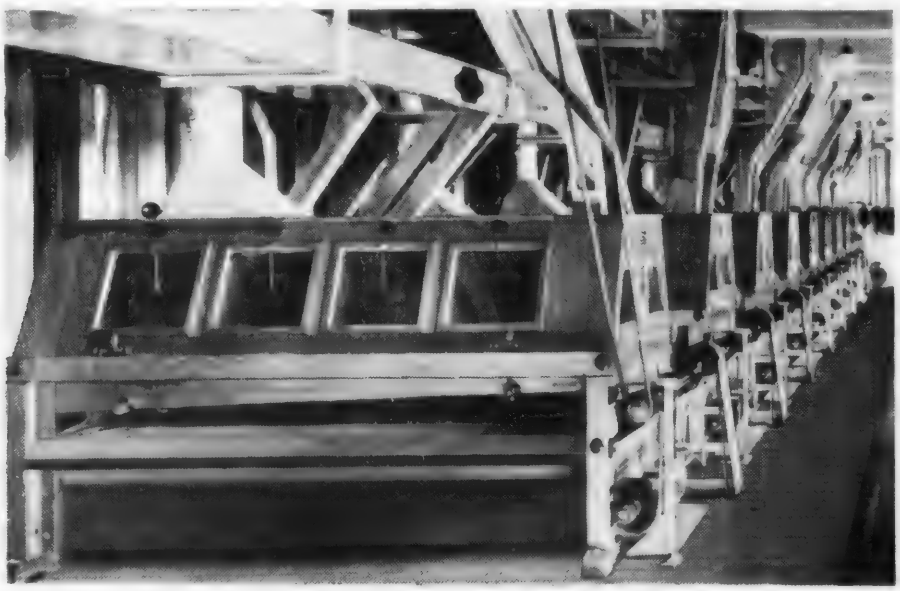
A. J. AMOS, Ph.D., B.Sc., F.R.I.C.

In the introductory paragraph to the 1947 review of the milling industry, it was stated that millers still continued to be servants of the Government and not masters of their industry. Strict Ministerial control imposed during the war still continued and had its restrictive effect upon competitive enterprise. The intervening twelve months have seen no change in the situation. However, although technical ability cannot now be given so wide an expression as in pre-control days, it has not lost in importance, since the production of good high extraction flour of prescribed vitamin content is a more exacting task than the milling of a pre-war type of low extraction flour.

OUR importations of wheat during 1948 resembled those for 1947 in that the bulk of the arrivals consisted of Manitoban wheat from Canada. A high proportion of this imported Manitoban was No. 2 and No. 3 grade wheat, and comparatively little No. 1 grade Manitoban was received. The consignments of No. 1 grade wheat which were received were but slightly superior to the No. 2 grade wheat in strength and protein content. The No. 2 and No. 3 grade wheats showed only minor differences in strength and protein content and, in many instances, could replace one another in a grist without causing a pronounced alteration in the breadmaking quality of the flour. The ordinary No. 4 grade wheat was good for the grade. It exhibited a strength similar to that of the No. 3 grade wheat, and was superior to the latter in protein content. Its protein was not so well balanced as that of the No. 3 grade, being rather stiffer and less distensible, but it did not exhibit the pronounced deadness and sluggishness which has characterised the protein of the No. 4 grade wheat in some past seasons.

Gluten Quality Good

Later in the year some cargoes of Special No. 4 grade were received, and these wheats proved to be strikingly exceptional in gluten quality and quantity for No. 4 grade. They contained fully 20 per cent. more protein than did the No. 1 grade samples, and this protein possessed considerably greater strength than that of the latter and was,



The purifier floor in a modern mill.

The roller mills for breaking down the wheat berry.

moreover, well balanced. The disadvantage attaching to these otherwise excellent wheats, and a particularly serious disadvantage when an extraction of 85 per cent. is obligatory, was their marked thinness. The presence of an appreciable proportion of such thin wheats in the blend would render it impossible to maintain an extraction of 85 per cent. without a significant falling off in colour.

The narrow range of data furnished by the ordinary grades No. 1 to No. 4 and the outstandingly good figures yielded by the Special No. 4 grade wheats are shown in Table I, in which are given the mean protein contents and the mean strength and stability figures of all the 1948 arrivals of each grade of Manitoban wheat. The figures for strength and stability from which the quoted means were calculated were obtained by means of a well-known dough testing apparatus, the Alveograph.

TABLE I

Mean data for 1948 arrivals of Manitoban wheats.

Grade.	*Protein Content (Per Cent.).*	*Stability.*	*Strength.*
No. 1	13·42	99	77
No. 2	13·35	99	75
No. 3	13·08	103	73
No 4	13·21	108	72
Special No. 4	15·62	103	93

Some dissatisfaction was expressed during the year with the grading of the Manitoban wheat. There must of necessity be some spread among the data of different consignments of even the top grade Manitobas, but in the past this spread has not been excessive and the millers knew, more or less, what they were getting when they bought, say, No. 2 Manitoba. During 1948, however, the spread of the data of the grades widened considerably and, indeed, on several occasions an arrival of top grade Manitoba proved to be no stronger than a filler wheat. It would seem that the explanation of these anomalies was the rate at which wheat was being shipped from the terminal elevators. It happened on occasions that an elevator was almost empty and incoming wheat was, in consequence, merely passing through the elevator to a ship instead of being mixed with other wheats in the elevator and a composite and averaged sample discharged to the ship. Nevertheless, the arrival of even a few cargoes of such completely abnormal wheat can be disturbing when millers are obliged to work to pre-ordained grists and with the wheats allocated to them.

Garnet and Amber Durum Wheats

Two other wheats which arrived regularly from Canada during 1948 were Garnet and Amber Durum. These two types are alike in that they exhibit similarly balanced, and from the point of view of breadmaking, unpleasing protein characteristics, but they differ in the amount of protein they contain and in the strength of that protein. The protein of each of these wheats is stiff and poor in stretching power and consequently causes the dough to be somewhat clay-like in nature. These characteristics are undesirable in a bread flour, and Garnet and Durum should not, therefore, be used freely in a bread grist, unless wheats possessing soft and distensible proteins are also present to effect compensation. The differences between these two wheats in strength and protein content are considerable. The Durum wheat is up to the Manitoba range in protein content, whereas the Garnet contains about 2½ units less protein per cent., and hence is a wheat of only moderate protein content. On the other

hand, it is the Garnet which has the superiority in strength and, although not up to the Manitoba class in this respect, it ranks as a strong wheat, whereas Durum is no more than a good "filler" wheat. The mean data for the 1948 cargoes of these wheats are given in Table II.

TABLE II

Mean data for 1948 arrivals of Garnet and Amber Durum.

Wheat.	*Protein Content (Per Cent.).*	*Stability.*	*Strength.*
Garnet	10·94	127	64
Amber Durum	13·46	114	53

Cargoes of Alberta Red Winter wheat arrived spasmodically. This wheat is not a strong wheat and, in fact, is scarcely up to a true "filler" in strength. In stability and strength it is very similar to many samples of Plate wheat. Mean data for the 1948 arrivals were: protein content 11·94 per cent., stability 70, strength 43.

Throughout the year cargoes of wheat arrived from the Argentine, but the total quantity of Plate wheat imported was very small compared with the importations of Canadian wheat. This Plate wheat was a good filler wheat in that it required little, if any, support from stronger wheats, although it was not strong enough to carry weaker wheats. The protein content was only moderate. Mean data for the year's arrivals were: protein 11·03 per cent., stability 88, strength 47.

Australian wheat was also imported throughout the year, although in comparatively small quantity compared with Canadian wheat. A significant proportion of this wheat was in very poor condition, being shrunk and showing excessive sprout and correspondingly high alpha-amylase activity. In fact, in a wide experience the author has never before encountered such a deplorable standard of quality in imported Australian wheat. The importation and acceptance of such wheat at a time when millers were forced to mill to 85 per cent. extraction and were provided with grists which already were, to say the least, "lean" when viewed from the angle of flour quality, was inexcusable. The inclusion of such out-of-condition Australian in the grist rendered it difficult to maintain the full 85 per cent. extraction without a deterioration in flour colour, and was liable to raise the alpha-amylase activity of the flour to an undesirable level. The sound Australian wheat possessed the usual weak gluten, and in respect of strength, or rather lack of it, and protein content the wheat was on a par with weak English wheat. The average data for the year's arrivals of Australian were: protein 9·71 per cent., stability 56, strength 22.

Spoilage during Transit

Instances were encountered during the year where part of a cargo of Manitoba wheat was in unsound condition. The nature of the spoilage varied; in some instances the wheat showed signs of having been heated, and its gluten proved to be very stable and short and unfit for breadmaking. In other instances the wheat gave evidence of some mould development, and the acquisition of a musty taint, while some samples possessed a foreign, but not a musty, odour. These forms of spoilage occurred in cargoes which had been overstowed by unseasoned timber. The confinement of such timber above a bulk of wheat in an enclosed hold, which possibly was at an elevated temperature during part of the voyage, was prone to lead to conditions of humidity which could cause spontaneous heating of the upper layers of wheat and in some instances the growth of mould. Some samples acquired a distinct timber-like odour.

The occurrence of instances of spoilage from this cause raised the question whether the chemical compounds with which some of the unseasoned timber was treated could be transferred to the understowed wheat to a dangerous extent. Investigation into the problem, however, revealed no evidence of cause for alarm.

Native Wheat

The bulk of the native wheat is very weak and low in protein content, and on its own is suitable only for the production of biscuit or confectionery flours. A few stronger varieties, more particularly Holdfast, are, however, grown, and these may approach the standard of a moderate filler wheat in strength. The native wheat of the 1948 harvest resembled that of the 1947 crop in protein content, strength, and general dough characteristics, but a significant proportion of the 1948 wheat showed sprout, and in consequence exhibited a high alpha-amylase activity. The trouble was not as pronounced as it was several seasons ago, but it presented the miller with a disturbing situation when regulations required that one-third of his blend should be native wheat, and particularly as the imported Australian which was also a compulsory constituent of the grist was also sprouted.

The average data for the native wheat in use during 1948, which would, of course, include wheat from both the 1947 and the 1948 crops, were: protein 9·46 per cent., stability 51, strength 20.

Composition of Grists

The official grists varied throughout the year according to the supply position of the various wheats in use. Usually maximum or minimum levels for native wheat and for Australian wheat were prescribed and the remainder of the blend was composed of Manitoba and other imported wheats such as Garnet, Durum, or Plate. Towards the end of the 1947 crop of English wheat, say in May and June, the proportion of native wheat in the blend

did not exceed 10 per cent., whereas by October, when the 1948 crop was freely available, the miller was called upon to use 40 per cent. of native wheat in the blend. The proportion of the other weak wheat, Australian, used in the blend was in the region of 10 per cent. to 20 per cent.

Nature of Breadmaking Flours

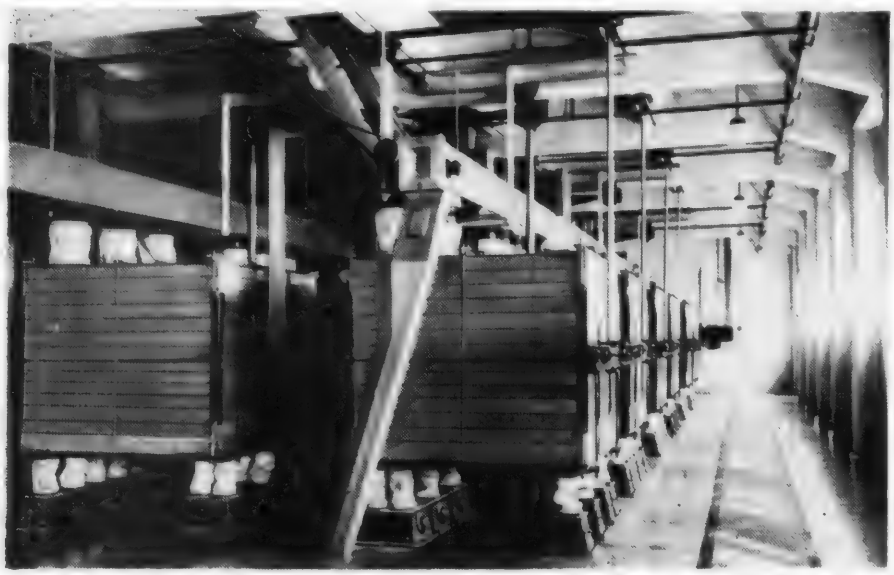
When at any given time all millers are employing the same grist, as has been the case since the introduction of control in 1939, the range of breadmaking quality between different flours is naturally much narrower than it used to be before the war, when each miller put into practice his own ideas upon wheat blending. Even so the differences in breadmaking quality and in colour, shown by different flours, are significant. Factors which contribute to these differences are the variations to be found in different consignments of the same type of wheat, and particularly of native wheat, differences in the conditions to which the wheats are brought prior to being milled, and differences in plants and flow sheets which influence the ease and efficiency with which the endosperm and the skins of the wheat are separated at the level of 85 per cent. extraction.

Throughout 1948 the practice of adding 14 oz. *creta praeparata* to each sack (280 lb.) of National flour was continued. This measure was introduced in the early days of 85 per cent. flour as a means of offsetting the increased intake of phytic acid which resulted from the consumption of bread from the longer extraction flour. The official instructions to mix imported white flour into National flour during milling also continued in force during 1948. The proportion of imported flour which had to be thus incorporated in our flour varied from time to time, but usually lay between 10 per cent. and 20 per cent.

In the early autumn of the year there occurred a marked decline in the baking quality of flours in general. There were several contributory causes. At that time the proportion of native wheat in the official blend was raised considerably because of the availability of the new crop; much of this wheat was of poor quality and often high in alpha-amylase activity, and the Manitoba portion of the blend consisted of lower grade wheat. Satisfactory bread could be produced commercially from these flours, but they were definitely less tolerant than the flours of a few months before against departure from optimum conditions and treatment during the breadmaking process. In consequence, complaints were not uncommon, and particularly, of course, from those bakeries where there was room for improvement in plant or craftsmanship.

Flour Purity

Reference was made in the 1947 review to the importance which the American Food and Drug Authorities were attaching to the purity of foodstuffs as revealed by the application of what they had termed the micro-analytical technique. This technique, which had become popularly known as "the filth test," disclosed the extent to which a foodstuff was contaminated with rodent hairs and insect fragments. Despite the very intensive cleaning operations which are a characteristic feature of the milling process and the adoption of strict measures of cleanliness throughout a mill, flour is still liable to show some contamination of the type just mentioned, although decidedly less than is found in some other foodstuffs. In view of the stringent standard which the American authorities



Plansifters are used for separating the stocks released by the break rolls.

Photos. courtesy Thos. Robinson and Son, Ltd.

had adopted in relation to this type of almost unavoidable contamination and the possible effect of this specification on our exports to U.S.A., a very considerable amount of investigational work into the problem was undertaken during the year. A very thorough practical study of the analytical technique was reported, and many cereal chemists became experienced in the test.

There has been a tendency for flour to be the scapegoat in connexion with contamination of foods with rodent hairs and insect fragments. Doubtless this is due, at least in part, to the fact that most of the foodstuffs involved have been baked goods containing flour, such as biscuits, cakes, and puddings. It happens, however, that certain other materials, which are present in many of these lines, are often far more highly contaminated than is flour, and in numerous instances the bulk of the contamination of the finished baked product comes from ingredients other than the flour.

The reason why it is difficult to avoid some, if only little, rodent hair contamination in flour, no matter how strict the measures of cleanliness imposed in the mill, is that the contamination comes in with the wheat, particularly native wheat, and at present there is no available means of effecting complete separation of such contamination from the wheat. The milling engineers are, however, giving this matter their attention, and progress in the problem is being made.

High Frequency Baking

During 1948 there was some revival of interest in the possibility of using high frequency heating for baking bread. There are certain attractive features in the suggestion, but there are serious drawbacks to overcome before it could be a commercial success. In the first place the process is decidedly expensive and sufficiently so to more than offset the reduction in baking time which it effects. The second disadvantage attaching to this method is that since the slope of the temperature gradient through the heated dough is the reverse of that which applies during oven baking, the cooked dough has no crust! It would seem, therefore, that the high frequency baking would need to be either preceded or followed by a short oven baking in order to give a crust to the loaf.

Trends in Milling Technology

The introduction of modifications and improvements into existing milling machines continued throughout 1948, but no outstanding development in milling technology occurred during the year. The milling engineers are, however, developing new ideas, and some of these are likely to be eventually generally adopted.

One line along which progress has been made and which promises well for the future is that of pneumatic conveying. On this system of conveying stock in a mill, an elevator leg would be replaced by an exhaust trunk of small diameter which would deliver into a very small cyclone, these small cyclones being exhausted through a suction filter dust collector. This system saves considerable space and makes unnecessary the present roller mill exhaust. Further, it ensures that the stocks are kept cool, and it reduces considerably the opportunities for pests to breed in a mill. On the other hand, it is fairly costly to install, has a high power consumption, and appreciably increases the milling loss.

Conditioning Treatment

Attention has also been paid to the subject of conditioning, and particularly in the light of lessons which have been learned through the need to mill well at 85 per cent. extraction. If the maximum benefit is to be gained from the conditioning of wheat, the conditioning operation should effect some loosening of the skins from the endosperm. The object of milling is to separate the inner endosperm from the surrounding skins with the minimum of contamination of the former with the latter, and theoretically there are two ways of doing this. The skins could be peeled off the endosperm or, as is done in milling practice, the endosperm could be scraped out from the skins. Obviously, however, any treatment of wheat which made it easier to "peel" the grain would be of equal assistance in the reverse operation which is the basis of milling practice. Attention has therefore been given to the problem of effecting some loosening of the skins of the grain during the conditioning treatment. An eminent miller aptly expressed the problem in the statement that if, as far as removal of its outer covering is concerned, a wheat grain in its natural state be likened to an orange, then the same grain after optimum conditioning should, on the same basis of judgment, resemble a tangerine. Success in this direction would seem to be attainable if, under suitable conditions, the wheat be subjected to sudden changes in temperature, and probably to sudden changes in water content. A form of "shock" conditioning of the former type is being tried commercially, and a new method, involving the use of high frequency heating, has been patented.

Bread and Nutrition

Two interesting contributions to the long-established controversy of the relative nutritive merits of different types of bread appeared during 1948. In one of them, children were the subjects of a feeding test in which flours of various rates of extraction, both enriched and unenriched, were fed in the form of breads, while in the other test unenriched and enriched breads, representing different rates of extraction, were fed to rats throughout several generations.

The breads fed to the children in the first test were made respectively from wholemeal, 85 per cent. extraction flour, 70 per cent. extraction flour, the 70 per cent. extraction flour enriched to the level of the wholemeal with B_1, riboflavin, nicotinic acid, and iron, and the 70 per cent. flour enriched with B_1 and iron to the level of the 85 per cent. flour. All the children received the same basal diet, but they were divided into five groups each of which received an unlimited supplement of one of these five types of bread. The test was continued for twelve months, and comprehensive clinical examinations at the commencement and the end of the experiment failed to detect any difference in the health and general condition of the various groups of children.

In the second investigation, three flours were investigated, namely, white flour, the same flour enriched with B_1, riboflavin, nicotinic acid and iron, and wholemeal. Bread made from one of these flours, supplemented by cod liver oil and, when necessary, vitamin E, was the complete diet of the animals. The importance of this investigation with rats lay in the fact that the criterion adopted was not the commonly employed rate of growth but the performance of the animals during gestation and lactation throughout three generations. In this more than usually stringent test the wholemeal bread proved to be inferior even to the unenriched white bread.

Flour Treatment

Two years ago Sir Edward Mellanby reported experiments indicating that the feeding of flour treated with nitrogen trichloride to dogs would lead to the occurrence of canine hysteria or "running fits." This discovery was disconcerting inasmuch as in this country and in America the bulk of the flour has been treated with nitrogen trichloride. Mellanby's findings were soon confirmed, whereupon the all-important question arose whether flour treated with this gaseous compound was in any way detrimental to man. In consequence, intensive investigation into the many facets of the problem was commenced by various teams of workers and is still in progress. As yet there has been no announcement of the discovery of the nature of the principle toxic to dogs produced by the action of nitrogen trichloride on flour, but several very important findings have been reported. Two discoveries of major importance are firstly, that the production of a canine hysteria-producing flour is confined to nitrogen trichloride, and all the other flour improvers have a clean bill of health, and secondly, that nitrogen trichloride treated flour, although harmful to dogs, has no ill-effects upon humans. In the autumn of 1948, however, public hearings were held in U.S.A. with a view to replacing nitrogen trichloride by chlorine dioxide, another gaseous flour improver, in the list of ingredients permitted in flour.

Ministry of Food

Latest Statutory Rules and Orders

The list given below is the continuation of the list of Orders published in *Food Manufacture*, Dec. 1, 1948, page 556.

No.	*Date.* 1948.	
		PRICE FIXATION ORDERS
2264	Oct. 10.	The Meat Feeding Stuffs (Control and Maximum Prices) Order, 1948. Revokes S.R. & O. 1943, No. 292.
2380	Nov. 7.	Order amending the Tapioca and Sago (Maximum Prices) Order, 1947.
2419	„ 15.	Order amending the Feedingstuffs (Maximum Prices) Order, 1948.
2470	„ 21.	Order amending the Chocolate, Sugar, Confectionery, and Cocoa Products (Control and Maximum Prices) Order, 1944.
		FEEDINGSTUFFS
2388	Nov. 8.	Order amending the Feedingstuffs (Regulation of Manufacture) Order, 1948.
		FRUIT
2364	Nov. 1.	The Home-grown Apples (No. 2) Order, 1948. Revokes S.I. 1948, No. 79.
2407	„ 14.	The Imported Apples Order, 1948. Revokes S.R. & O. 1946, Nos. 1466, 1553; 1947, Nos. 739, 1423, 1928; S.I. 1948, No. 147.
		GELATINE
2460	Nov. 22.	The Edible Gelatine Order, 1948. Revokes S.R. & O. 1947, Nos. 161, 968.
		MEALS IN ESTABLISHMENTS
2461	Dec. 19.	The Establishments (Christmas Turkeys) Order, 1948.
		POINTS RATIONING
2414	Nov. 7.	Order amending the Food (Points Rationing) Order, 1948.
		RATIONING
2405	Nov. 7.	Order amending the Sugar and Preserves (Rationing) (No. 2) Order, 1948.
2406	„ 7.	The Food Rationing (General Provisions) Order, 1948 (General Licence) Order, 1948.
2497	„ 21.	Order amending the Bacon (Rationing) Order, 1948.
		RESTRICTIONS ON DEALINGS
2235	Oct. 10.	Order amending the Food (Restriction on Dealings) Order, 1943.
		SALVAGE
2141	Oct. 1.	The Salvaged Goods Order, 1948. Revokes S.R. & O. 1945, No. 1091.

Tomato Ketchup and Curry Powder

In January 1948 the Minister of Food announced that he had appointed a Food Standards Committee to review the composition of foods and to recommend standards, based on quality and nutritional value, designed to protect consumers against the sale of inferior products. The Committee has continued the work which was started in 1942 by the Inter-Departmental Committee on Food Standards and has considered the need for standards for a number of foods.

THE Committee's work on two of the standards has revealed the desirability of prescribing limits for the metallic content of the foods concerned. This has led to the appointment of a Sub-Committee to consider the available evidence of the effect of the ingestion of foods contaminated with minute traces of metals or other injurious elements and the possibility of prescribing limits for such contamination generally. A number of scientific bodies and research associations, including the Medical Research Council and the British Food Manufacturers' Research Association, are co-operating with the Sub-Committee in the enquiry.

Other Standards to be Prescribed

The Food Standards Committee is at present considering the possibility of prescribing standards for ice cream, processed cheese, iodised salt, edible gelatine, and preserves.

The Minister has approved for publication the Committee's reports containing recommendations for tomato ketchup (and kindred products) and curry powder. The following are abstracts of these reports.

Tomato Ketchup

1. The Food Standards Committee has recommended to the Minister of Food that a standard of composition and a limit for copper contamination should be prescribed for tomato ketchup, catsup, sauce, and relish, and that, in addition, the ingredients of these products should be disclosed on the labels.

2. The Committee recommends:

(*a*) That tomato ketchup, catsup, sauce, and relish shall contain not less than 6 per cent. by weight of tomato solids, derived from clean and wholesome tomatoes or from tomato *purée*, or its equivalent, made from clean and wholesome tomatoes. The tomato ketchup, catsup, sauce, and relish shall be free from tomato seeds and skins and shall contain no fruit or vegetable other than tomatoes except onions, garlic, and spices added for flavouring purposes.

(*b*) That a limit of 6 parts of copper per million parts of tomato ketchup, catsup, sauce, or relish be prescribed and that this limit be reduced to 3 parts of copper per million parts of tomato ketchup, catsup, sauce, or relish at the earliest practicable date.

(*c*) That the ingredients of tomato ketchup, catsup, sauce, and relish shall be disclosed on the labels of these products in accordance with Article 2 of the Labelling of Food Order (S.R. & O. 1946, No. 2169).

3. The Committee concurs in the opinion of the trade that the definition of tomato ketchup in the Pickles and Sauces Order (S.R. & O. 1947, No. 876) is of little value because the Order does not prescribe a minimum tomato solids content for the product. This is met at (*a*) above by retaining substantially the same definition and adding a quantitative standard of composition.

4. In arriving at its recommendation, the Committee has taken into account the following information received from the trade:

(*a*) A minimum tomato solids content of 6 per cent. is consistent with a concentration of 25 lb. of 28 per cent. to 30 per cent. tomato *purée* per cwt. of tomato ketchup.

(*b*) This concentration accords with that used by the best manufacturers before the war.

(*c*) Present supplies of tomato *purée* are sufficient to enable tomato ketchup and similar products to be made to the standard recommended. Most supplies of tomato *purée* contain neither seeds nor skins.

(*d*) Other usual ingredients of tomato ketchup, catsup, sauce, or relish are vinegar or acetic acid, onions and/or garlic, flavouring, sugar, salt, spices, artificial colouring, starch, or edible gum.

(*e*) The sources of copper contamination are the fruit sprays and processing plant, the latter being the main source of contamination. The present working limit of the Port Health Authorities for copper in tomato *purée* is 100 p.p.m. calculated on the dry solids.

5. The Committee is satisfied that the prescription of the standard recommended in 2 (*a*) above would be in the interests of the consumer. It does not consider it necessary or desirable to regulate the use of any ingredients other than those named, and in the manner prescribed, but since the standard recommended does not control all the ingredients of tomato ketchup and similar products, it is desirable that they should be disclosed on the label. The Committee considers that the working limit of 100 p.p.m. for copper in tomato *purée* should be reduced to 50 p.p.m. at the earliest date by which the concentration plant and processes can be improved, thus reducing the copper content of tomato ketchup containing the minimum tomato solids prescribed from 6 parts to 3 parts of copper per million parts of tomato ketchup.

Curry Powder

1. The Food Standards Committee has recommended to the Minister of Food that a standard of composition and a limit for lead contamination should be prescribed for curry powder.

2. The Committe recommends (*a*) that curry powder should contain at least 85 per cent. of spices, aromatic seeds, and aromatic herbs, and that limits for the other ingredients, *e.g.* farinaceous material and salt, need not be specified in the standard; (*b*) that on the evidence before the Committee a tolerance of 10 parts per million of lead in curry powder might be permitted, but that this should be subject to review with the object of lowering it when possible.

3. In arriving at its recommendations the Committee has taken into account:

(*a*) Reports from local Food and Drug Authorities which had disclosed that some curry powders on sale in this country had contained substantial quantities of non-spice material, viz. added farinaceous material and salt.

(*b*) Evidence from the trade (including importers of Indian curry powder, U.K. manufacturers of curry power, importers of spices and representative firms of the catering trade) and from the Indian Trade Commissioner in London.

(*c*) The following suggestions for standards of composition:

Proposed by	*Minimum Spice Content (Per Cent.).*	*Maximum Salt Content (Per Cent.).*	*Maximum Farinaceous Matter (Per Cent.).*
(i) Food Manufacturers' Federation ..	75	10	Up to 15
(ii) Some U.K. curry powder manufacturing firms ..	100	—	—
(iii) London Wholesale Spice and Rice Dealers' Association ..	95	5 per cent.	
(iv) Indian Government Central Committee for Food Standards ..	85	5	10 max.
(v) Indian Government Trade Commissioner	75-80	10	10-15

(N.B. in the case of (iv) the permitted spices are enumerated and the 5 per cent. allotted to "salt" may contain unenumerated spices.)

4. It was noted that the standard suggested by the Government of India enumerated the spices to be permitted, but the Committee considered that the freedom of manufacturers should not be restricted in this respect.

5. Conflicting opinions were expressed as to the value of added farinaceous material, particularly Bengal gram flour, in retaining the volatile oils of the spices, preserving the flavour and improving consistency, and of salt in preventing infestation with mites. Laboratory tests made at the request of the Committee lend no support to the claim that salt prevents mite infestation of curry powder. The effect of added farinaceous material on the volatile oils of the spices could not be determined, since slight changes in the volatile oil content of the spices could not be measured analytically. On consideration, however, the Committee could see no objection to the inclusion of farinaceous material and salt within the limits proposed.

6. The control by analytical methods of a standard specifying the content of spice, salt, and farinaceous matter in curry powder does not present great difficulty. The salt content can be determined accurately and the starch contributed by added farinaceous ingredients estimated with reasonable accuracy. The total spice content can be determined within an accuracy of 3 per cent. or 4 per cent.

Electronics in Industry

OPENING the Electronics Symposium, organised by the Scientific Instrument Manufacturers' Association, at Caxton Hall, Westminster, Sir Edward Appleton, Secretary of the Department of Scientific and Industrial Research, said that every industrial firm ought to be constantly asking itself whether operations could not be carried out more efficiently by electronic equipment.

Very often the introduction of electronic equipment in industrial processes resulted in remarkable economies. In sugar refining, for example, the presence of pieces of metal would cause scoring of the rollers, which might result in a drop of output of as much as 5 per cent. In an average mill this would mean a loss of 3,750 tons of sugar annually, worth £100,000. This could be saved by installing, at a cost of about £600, an electronic metal detector associated with an automatic rejection mechanism.

Electronic equipment could be used, said Sir Edward, by the mathematician to speed up his computation, by the meteorologist to sound the troposphere and the stratosphere, by the industrial inspection department for checking the absence of internal flaws in castings, for the detection of foreign substances as impurities in plastics and textiles, for the detection of moisture in stored grain, as well as for detecting the presence of harmful rays, and in uranium ore prospecting.

The establishment by the Department of Scientific and Industrial Research of a small advisory group of experts who would visit firms and assist in the identification of operations where the possibility of using automatic electronic and other equipment was worth investigating was mentioned by Sir Edward.

S.S. "Thule," tanker and canning factory ship.

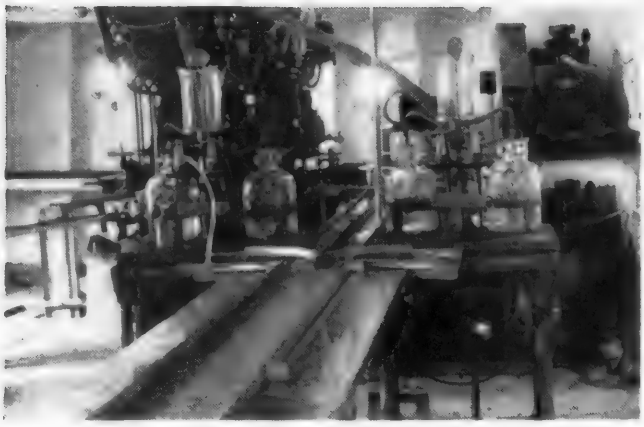
A New Seagoing Whale Meat Cannery

W. J. BLOIS JOHNSON, B.Sc., A.M.I.C.E., A.C.G.I.

For many years whale meat has been a popular form of food with Norwegians, but it is only during the last few years that it has been imported in any quantity to supplement the protein diet of people in the British Isles. So far imports have been confined to frozen whale meat, but exhaustive experimental work and canning trials have shown that whale meat may be canned in a number of attractive packs, and the results achieved have been so promising that United Whalers Ltd. have installed in one of their ships a canning plant to pack the whale meat soon after the whale is killed.

THE canning plant is installed in the forepart of s.s. *Thule*, a 10,000 ton tanker, normally employed in carrying fuel oil to the fishing grounds for the Company's fleet of ships, and for carrying whale oil on the return journey. This plant is arranged on three decks, and the fresh meat is passed from the top deck downwards through the preparation, filling, and closing machines on the deck below, and then down to the cooking and packing section on the third deck. Compared with a factory on land, the space available in a ship is constricted, and special attention had to be paid in designing the layout to give an even flow of material through the

Dump blanching machines.

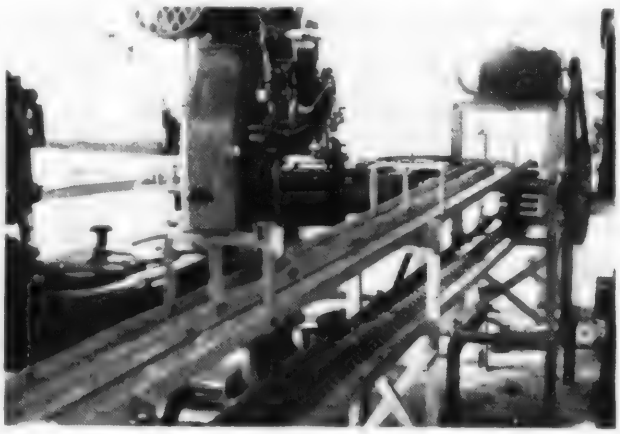


Can filling conveyor with vacuum sauce fillers and double seamer behind. Two vacuum pumps are installed on shelves on the right.

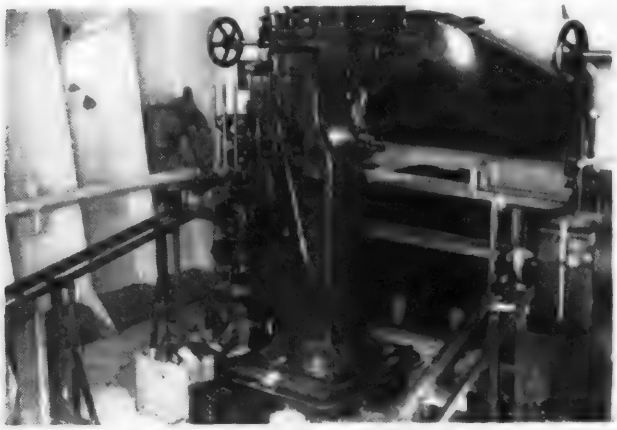
plant while allowing adequate space for the operatives. Another consideration that complicated the installation was the fact that ships' decks are not level. Both sheer and camber had to be allowed for, which are accentuated in the bows of a ship. For instance, a can-filling conveyor running athwartships was at least a foot higher above the deck at its end than where it passed over the crown of the deck. Special supports had to be built up from the deck to enable each machine to be erected in a level position. Other difficulties, not met with on land, that had to be overcome included compliance with Board of Trade regulations for seagoing ships. For instance, holes in decks and bulkheads could not be made at random, but had to conform to the regulations.

The season for blue whales opened last year on December 15. Blue whales are protected by international agreement, under which only a specified quota is allowed to be killed each year to ensure that supplies are not diminished by excessive killing. The season closes when the quota of whales has been taken, and inspectors aboard the ships ensure compliance with the agreement.

The whales are harpooned from small ships known as catchers which tow them to the factory ship, where they are hauled aboard, cut up, and the oil and other valuable products extracted. Selected cuts of meat will be taken from the 22,000 ton factory ship *Balaena* and transferred to the cannery ship nearby. The meat for canning will therefore be absolutely fresh and will be canned within a few hours of the whales being killed.



Outlet end of can filling conveyor, showing arrangement for feeding cans to either or both seamers.



One of the No. 6 vacuum double seamers.

Blue whales have an average weight of 63 tons, and have kidneys weighing as much as 160 lb. In the height of the season twenty whales may be handled in twenty-four hours, so ample supplies of material will be available for canning.

On arrival at the cannery ship the fresh meat will be taken to a platform on the forecastle, and cut up by hand with flensing knives into pieces of a convenient size for feeding to the mechanical cutters. Three batteries of cutters are installed, which consist of sets of circular blades mounted on horizontal shafts, the meat being fed through partly by gravity and partly by centrifugal action. The first cutter slices the meat into slabs, the second into strips, and the third into cubes of a size suitable for a stew. A battery of power mincers is also installed for

Outlet side of one of the No. 6 vacuum double seamers, showing can zigzag which takes the closed cans to the deck below.

the preparation of mince. A batch mixer and two dump type blanchers are installed to complete the machines required for the preparation of the meat for the different types of pack.

Filling the Cans

The cans will be filled by hand from portable stainless steel containers on either side of a can-filling conveyor which first carries the filled cans to two vacuum filling machines which will top up the cans with gravy or sauce for those packs which require it. Vacuum filling is being employed to ensure thorough penetration of the sauce into any air spaces left in the cans. An emulsifier is installed for mixing thoroughly the flour, seasoning, and other ingredients used in the sauce, which will be pumped to an overhead storage tank to feed by gravity to the fillers.

The filled cans will then pass on to one or other of two vacuum double seaming machines. Whenever necessary throughout the plant machines have been duplicated to give a steady production flow over the full twenty-four hour period, this duplication allowing for adjustments and possible breakdown without holding up production.

A 400 volt, 3 phase, 50 cycle Diesel alternator set is installed for the canning factory, and also a motor converter set so that an A.C. supplementary supply can be obtained from the ship's main D.C. supply.

The filled and sealed cans will pass from the vacuum seamers down through can "zigzags" to the cooking section on the deck below for sterilisation in a battery of six horizontal retorts equipped for pressure cooling, the compressed air supply being obtained from an air compressor set.

After cooling in the retorts, the cans will pass through a can washer and on to a drying conveyor which will take them to the packing section, where they will be packed into cartons and transferred to storage. Labelling will be carried out on arrival in England.

Packing during the first year will be entirely in A1 Tall cans, treated inside with meat lacquer and outside with a protective lacquer. They will be taken out in the ship ready for use. Air-conditioning has been installed in the holds to prevent any deterioration of the cans during the voyage out and back.

Types of Pack

The plant has been designed so that the type of pack can be varied as required. By correctly processing whale meat and canning it absolutely fresh, extremely palatable packs of stewed steak, steak

Battery of six horizontal retorts equipped for pressure cooling and fitted with temperature regulators.

and kidney stew, mince, etc., can be prepared which do not have the unpleasant fishy flavour usually associated in this country with whale meat. In appearance and flavour the canned whale meat closely resembles canned beef steak, and when supplies are available it should completely eradicate the unfortunate prejudice which many people now have against whale meat.

The whole canning plant, including all electrical equipment, was supplied and installed in the ship ready for testing in four months from the time the first order for the plant was placed, which under present difficult conditions does credit to all the manufacturers concerned.

The *Thule* sailed from Liverpool for the Antarctic *via* the Cape on October 24, and it is hoped that the first supplies of canned whale meat will be arriving in this country about March next. It should prove very popular, especially as it will be unrationed.

SUPPLIERS OF EQUIPMENT

Meat cutters: *Cammell Laird and Co., Ltd.*
Power mincers: *Swift and Swallow, Ltd.*
Batch mixer: *Alite Patent Machine Co., Ltd.*
Blanchers and conveyors: *G.C. Engineering Co., Ltd.*
Vacuum filling machines: *Gravfil Machines, Ltd.*
Emulsifier: *Lang-London-Ltd.*
Pumps: *Mono Pumps, Ltd.*
Vacuum double-seaming machines and cans: *The Metal Box Co., Ltd.*
Air compressor set and temperature regulators for retorts: *Short and Mason, Ltd.*
Retorts: *John Fraser and Son, Ltd.*
Stainless steel containers and buckets: *Andrews Bros. (Bristol), Ltd.*
Can washer: *Robert Kellie and Son, Ltd.*
Motor alternator set: *Dynamo and Motor Repairs, Ltd.*
Installation work: *Murray (Scientific Instruments), Ltd.*
Contractors for supply of machinery and advisers on design and selection of plant and layout: *Food Equipment, Ltd.*

How to Run Cold Stores

ON opening a new technical book, the dismal suspicion sometimes assails the reviewer that he is about to plough through the same old compilations and *clichés* which comprise some of them. It was with pleasurable feelings that the first few pages of a new book* were read. The subject was not exactly a picturesque one for the "outside man," but the writing gripped this reader. Here was the writing of a man who "knows his stuff" and could put it over in a convincing way.

As the author states in his preface, the book is a guide to cold store operation—the work entailed in receiving, storing, and delivering goods—refrigerated warehousing. He "avoids technicalities," and yet (it's an old story, but this is one of those cases where the author fulfils his promise) he "wants to help those engaged in actual refrigerated warehousing who have not the time or the opportunity to extend their knowledge into the scientific aspects of cold storage work."

In the first chapter, the author plunges into a general description of cold stores. The flow of information is smooth and concentrated and yet couched in such language as allows easy absorption on the part of the reader. And similarly through the subsequent chapters dealing with the handling of goods, checking, trucks used, dunnage, chamber work, general warehousing, storage of meats, and all other frozen products. Further chapters deal with different types of chambers, their temperatures and operation, general maintenance, mould in cold storage, revenue, and accounts.

An exhaustive table gives commodity data, which in five pages contains a veritable mine of numerical information concerning every conceivable product likely to find its way into cold storage.

Anyone having any connexion with cold storage cannot afford to be without this most excellent book.

* *Cold Storage Practice.* By A. E. Miller, M.S.E., M.Inst.R. Pp. 246+xi. London. Price 27s. net.

Report of South American Mission

EARLY in 1947 the Agricultural Departments despatched a Mission to South America, the main objects of which were to strengthen the friendly relations between the South American countries and the United Kingdom and to foster the purchase of British pedigree livestock, more particularly dairy cattle, by certain South American countries. The Mission was also to explore the possibilities for the export trade in agricultural machinery and other agricultural requisites.

The recently published Report* of the Mission contains a number of recommendations aimed at increasing export trade with South America. These include the suggestion that greater publicity should be given to British breeds of livestock by the issue of attractive pamphlets in the language of the country, and that every effort should be made to ensure that animals exported are worthy representatives of their breeds. Dealing with the export of machinery, the Mission suggests that British agricultural machinery manufacturers will need to concentrate on mass-produced lines for export, and emphasises the need for an adequate servicing organisation and the standardisation of spare parts.

* *British Agricultural Mission to South America, 1947.* Pp. 51. H.M.S.O. Price 1s. net.

Edible Flour from Oilcake

W. G. CASS

Part II

In the second part of this series the nutritive values and modes of use of groundnut flour are discussed.

THE vitamins in groundnuts belong almost entirely to the B complex, comprising B_1 (aneurin or thiamin), B_2 (riboflavin), and nicotinic acid or niacin; and in these, especially in the first, groundnuts are rich. The whole nut contains, of the first, 0·252 mg. per ounce, and comes second (after dried brewers' yeast) in the list given in the *Manual of Nutrition*; of the second, 0·08 mg. per ounce; and of the third, 2·6 mg. (fourth in the list). Jacquot and Matet have recently determined the more interesting constituents of groundnut cake, as follows (per cent.): moisture 6, proteins 56·8, ash 4, fat, 8·6, cellulose 4, other glucosides 21·3, calcium 0·127, phosphorus 0·8, and iron 0·0035; vitamins in I.U. per 100 g.—B_1 (thiamin) 750, B_2 (riboflavin) 350, and niacin 25,000.

Nutritive Value of Groundnut Cake

The nutritive value of groundnut cake for cattle has long been widely known; and groundnut flour for human beings has been tested, among others, by M. Boigey, more particularly for children, with good results. It was used in various food preparations. Its value in Calories is about the same as wheat flour, *i.e.* 357-365 Cal./100 g. More recent work in France has been undertaken by Mme. Randoin and co-workers, chiefly with young rats. Varying amounts of defatted flour were incorporated in a standard diet, but it was found undesirable to go beyond 20 per cent. groundnut flour. In another series, by adding the flour or dried brewers' yeast to starch, diets of identical protein content were obtained; but while those with brewers' yeast sustained normal growth in the rats, the diets containing groundnut flour could not do so, and half the rats died in three months. This does not appear to be a very satisfactory or conclusive test, as summarised by M. Cuvier. In other cases groundnut flour was compared with casein. Addition of 5 per cent. butter to these was favourable in the case of the flour but not with casein. Larger additions of groundnut flour, up to 86·5 per cent., appeared to give better results when 5 per cent. butter was added, together with mineral salts, *e.g.* calcium lactate, to increase the calcium/phosphorus ratio; and still better with addition of 2·5 per cent. brewers' yeast. It is concluded that the unfavourable results recorded above were due to insufficiency of fat and vitamin A.

In fact, it is deduced from the whole series of tests that groundnut flour proteins can satisfactorily replace those of meat; though Mitchell and others have pointed out that, owing to the flour being often less digestible and biologically inferior (this latter is somewhat vague), the groundnut flour is not utilised to the best advantage by the organism, as compared with meat protein. Thus 1·47 g. of nitrogen should be absorbed from groundnut flour to obtain the same results as with 1 g. nitrogen from beef. The possibility of a slightly poisonous alkaloid being present in the flour has so far been negatived; but the authors cited recommend that there must be a limit to the proportion of groundnut flour taken in the daily diet. Cooking and methods of use generally are also of primary importance. Another point of importance which is not yet definitely settled is the percentage of oil to be left in the flour. Obviously its presence tends to impair keeping qualities, and on the other hand its removal reduces nutritive or energy values.

Methods of Use

The most simple method is that already practised fairly extensively, namely the incorporation of a certain percentage of groundnut flour with other flour, and preparing from these flour mixtures various food specialities, such as soups, sauces, biscuits, and different types of bread. It is said that the de-fatted flour has proved very successful as a substitute for casein in the so-called caseinated biscuits. For ordinary bread and pastry, however, it appears that the groundnut flour content should not usually exceed 10 per cent. to 15 per cent., otherwise there is risk of repeating the error of Parmentier, who endeavoured to bake bread with too large a proportion of potato flour. The percentage might even be reduced to five in many cases, as is at present the practice with soya flour; and even this would prove very useful in diets poor in meat protein.

On the other hand, higher contents of groundnut flour can be recommended in some dough or pastry mixtures, up to 15 per cent. to 20 per cent., but not more, otherwise the mixture, when baked, may have an unattractive gelatinous appearance. In biscuit manufacture, especially to replace casein, groundnut flour up to 15 per cent. or thereabouts may be used. This type of biscuit, previously made from a formula containing 100 kilos wheat flour and 20 kilos casein, was, by way of comparison, manu-

factured from a mixture containing 90 kilos wheat flour, 20 kilos groundnut flour, and 10 kilos casein; also without casein and with up to 30 per cent. groundnut flour. Macheboeuf and co-workers have tried the following formula:

Wheat flour 22·5, de-fatted groundnut flour 5, casein 2·5, margarine 3, sugar 5·5, salt 0·37, ammonium bicarb. 0·125, sodium bicarb. 0·125, water 5·5.

This is just over 11 per cent. of groundnut flour. The biscuits should be baked at a rather lower temperature than is usual with ordinary casein biscuits. The same author (*loc. cit.*) has described also other food preparations, including vegetable soups and conserves.

There appears to be room for further research in this field, and with other oilcake flours, including that of sunflower seed.

Reference was made in the first part of this article to the Skipin process for treating oilseeds. This has recently been described in *Oleagineux*, 1948, **3**, 385-6, based on Russian originals dated 1933-34. A. I. Skipin was a Russian engineer who, about 1928-29, used or introduced what may be called the water-displacement method of expressing oil, which consists in grinding or crushing the seeds or nuts and then submitting them to special heating and damping in stages. The method was modified by Goldowski, in which the series of operations included softening and kneading in cold water for 18 hr. to 24 hr., cooking, and then grinding. With this method humidity throughout must be strictly controlled according to the kind of seeds or nuts treated.

German Tests

Groundnut flour tests in Germany have been reported by Adolf Schulz in *Getr. Mehl. u. Brot*, July, 1948, 110-111. The use of a certain percentage of this flour in bread-making has been prescribed by the occupying powers. Meal from solvent extraction is subjected to 60 per cent. or 80 per cent. milling, and the baking tests were made with (*a*) wheat flour containing from 0 per cent. to 10 per cent. of the groundnut flour, (*b*) flour mixture containing 65 per cent. wheaten, 30 per cent. maize, 5 per cent. soya, and from 9 per cent. to 10 per cent. groundnut flour (of 60 per cent. and 80 per cent. milling extraction). Generally there were no very marked differences in the bread, except with the higher percentage additions the flavour deteriorated, and there was some difference in texture and loaf volume. It is concluded that the additions should not exceed about 3 per cent. Although flavour appears to have been the principal factor affected, it was sufficient with other things to lower the Dallmann evaluation index as follows:

Groundnut flour per cent.	0	1	2	3	5	10
60 per cent. extraction	162	141	120	94·6	65	65
80 per cent. extraction	119	91	78	73	46	38

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(*Continued on page 23*)

Operation Food Hygiene

CRITICISM of past and present practice and proposals for the future were heard at a discussion on food hygiene held by the Royal Sanitary Institute last month under the chairmanship of Sir Weldon Dalrymple-Champneys, Bt., D.M., F.R.C.P.

In an introductory paper Councillor William L. Roots, Barrister-at-Law, chairman of the Public Health Committee, Kensington, said that many people were aware that the country's food services were not as good as they should be. These people should be encouraged and guided on voluntary lines both now and with a view to a national recognised scheme later.

Two Aspects of the Problem

The subject appeared to divide itself into two aspects—standards of food value and of cleanliness. In addition to the extension of the present system of food standards to cover as many kinds of food as possible, standard gradings which could be easily communicated to the public should be adopted. The technicalities of grading would be a matter for the Ministry of Food and the producers' councils.

Dealing with standards of cleanliness in food premises, he thought that the first thing to do was to adopt standards with certain criteria attaching to each. In preparing grades, Class I might be first-class modern shops, Class II reasonably good premises, and Class III poor but well-maintained establishments. The position regarding cleanliness in handling was more difficult, and the aim should be to achieve as much pre-packing as possible. Here again the grading system could help; the responsibility for maintaining clean and healthy employees would rest on the employer, and failure would be punishable by the down-grading of the shop.

Fresh Approach Needed

He felt that it would be hard to make progress on present lines, and he therefore suggested that a fresh approach should be made somewhat on the lines of the modern town planning legislation. Such a system as he advocated would, he felt, make for simplification from everyone's point of view; improvements were more likely to be effected by public demand, he contended, than by fines on detailed infringements.

With products so vital to the national survival, the loss of man-power caused by the consumption of contaminated or infected food was a serious matter, stated Mr. H. W. Walters, Chief Sanitary Inspector, Kensington. Lack of hygiene in food premises, he said, could to some extent be attributed to inadequacy of legislation, and to emphasise this he compared British and American legal provisions relating to cleanliness in rooms used as restaurants. He had little doubt, however, that if existing law were enforced more strictly much improvement would result; legislative progress in the immediate future would best be achieved through the agency of new regulations and by-laws.

Grading Food Premises

He thought that grading of food premises might well prove to be a most effective factor in the promotion of a successful food campaign, and it was possible that the trader would prefer a single rather than a three-tier grading, since the public could not be expected to appreciate the technical difference between several grades. Whatever system were adopted, it was essential that it should be uniform. In pre-war days a national mark which applied to various food commodities conforming to prescribed standards had been introduced, and Mr. Walters thought that the same idea might be applied to hygiene. In any voluntary grading scheme there would be a need for local food advisory committees, whose task would be to consider all matters relating to food hygiene and to make recommendations as to codes of practice for the various food trades. With the introduction of the scheme would come the need for educating food handlers, and he thought the Ministry of Food could give a lead in this respect.

Mr. Walters made certain proposals for the routine sampling and examination of food which would ensure that all available trained staff could concentrate on the work of "Operation Food Hygiene." Nevertheless, the chemical and bacteriological laboratories would have to play a more important part in the future in the fight to obtain cleaner food, and the time had arrived, he thought, for the establishment of a national food laboratory service. Lasting improvement, however, depended on the children, and he suggested that food hygiene should be made a compulsory subject in all schools.

During the discussion which followed, members of the audience were invited to give their views and comments on the papers read, to which Mr. Roots and Mr. Walters replied. Speakers included representatives from the Ministries of Food and Health and the Central Council for Health Education.

Edible Flour from Oilcake

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Seaweed Research in Chile

A BETTER use of seaweed as a source of food is among the industrial possibilities suggested by Professors Juan Ibanez and G. B. Marini-Bettolo in their recent study of Chilian seaweed (*Chim. et Ind.*, 1948, **30**, 195-199). There are enormous resources of raw material along most of the coast of Chile, and during the past few years the authors have undertaken much research in both the botanical and chemical aspects at the University of Chile, Santiago. The materials are fairly easily accessible; drying is a less serious problem in that climate than in some other parts of the world, and among the numerous species identified are some that are not found elsewhere.

Although there are numerous references to work already done in seaweed research, such as that of Heilbron, Barry, and others, no mention is made of that of Dr. W. A. P. Black and colleagues of the Scottish Seaweed Research Association, as described in their 1947 Report and in the literature (*Chem. and Ind.*, 1947, 723-724; *J.S.C.I.*, 1948, **67**, 165). However, it is pointed out that knowledge of the polysaccharides of marine algae has been greatly advanced by workers in Great Britain and Ireland.

Manufacture of Alginates

There is much more to be done, especially from a food point of view. Beside the constituents already fairly well known, such as laminarin, agar, carrageen, iridophycin (or fucoidin), alginic acid, etc., there is a wide field for chemical study of pigment contents, sterols, and fatty matter. Among the principal possibilities described from the Chilian point of view is the manufacture of algin, alginic acid, and alginates. The two species best suited to this purpose are *Macrocystis pyrifera* and *Durvillea utilis*, both of which are abundant and, reckoned on the dry matter, contain from 14 per cent. to 30 per cent. alginic acid, total organic matter being 55 per cent. to 62 per cent. The well-known variations in constitution of most kinds of seaweed according to season and other conditions are noted. *D. utilis* is much used locally for food and other purposes, *e.g.* as fertiliser and food. It is said to be a valuable source of calcium in the diet, often lacking in Chilian soils and vegetables. A popular dish is prepared from the sucker discs with which the plant adheres to its supports. Although it contains more alginic acid than *M. pyrifera*, the presence of brown colouring matter or pigment in the products may give some trouble.

For the manufacture of agar the best species would include *Gracilaria lemaeniformis* and *G. confervoides*, the latter being well known as a source of agar agar. Reckoned on dry matter (76·5 per cent.) these contain 11 per cent. to 16 per cent. ash, 20 per cent. to 35 per cent. polysaccharides, and 2·5 per cent. nitrogen.

Another well-known seaweed product, carrageen, could be obtained from suitable species which are also abundant along the coast, such as *Chondrus canaliculatus* and others which, with a water content down to 10 per cent. to 18 per cent., contain total polysaccharides of 55 per cent. to 78 per cent., with nitrogen around 2 per cent.

The production of funorin, iridophycin (fucoidin), and laminarin is also described. As pointed out by Dr. Black and in the discussion of his paper (*loc. cit.*), the chief possibilities from the food point of view would appear to be in mannitol, laminarin, and the alginates. Although the laminarin content, like other constituents, varies with season, the total percentage may reach 37 per cent. The Santiago workers state that, so far, little use has been found for laminarin; and the same view was expressed by Dr. Black, but the latter added that it should be an excellent source of food as it is readily hydrolysed to glucose, and should be valuable in diabetic diets. In regard to alginic acid and the alginates, these are in increasing demand, with mannitol and laminarin as valuable by-products. The alginates, in particular, should find an enormous market in the food industries.

Fruit and Vegetable Research

A STUDY of the annual report of the Fruit and Vegetable Preservation Research Station, Campden, for 1947 shows that in addition to advisory and scientific work of a routine nature, much useful research has been carried out and definite progress has been made in elucidating some of the problems connected with the survival of the spores of thermophilic bacteria in canned vegetables.

Investigations into canners' problems were carried out and the voluntary scheme of inspection for assessing the quality of canners' packs was continued throughout the year. Much administrative work has again been done for the Ministry of Food in connexion with their Canned Fruit and Vegetables Orders, in addition to checking all the reports submitted by the inspectors on a large number of cans of beans in tomato sauce.

Research and experimental work has been devoted to the quality of canned fruit, canned peas, and quick frozen fruit and vegetables, vitamin C in blackcurrant pulp, electro-tinned plate for vegetable cans, effect of incubation on *p*H of canned vegetables, and the internal rusting of cans.

Included in the report are papers by F. Hirst and W. B. Adam on variety trials for canning and quick freezing, the effect of organic spray residues on canned blackcurrants by W. B. Adam, W. M. Dowson, and R. W. Marsh, the estimation of maturity of canned green peas by W. B. Adam, the heat resistance of the spores of thermophilic bacteria, and the significance of bacteriological standards for canners' sugar—both by T. G. Gillespy.

Pigeon Squabs for Canning

ERIC HARDY, F.Z.S.

In view of the recent news that starlings, moorhens, blackbirds, gulls, and lapwings have been added to the nation's menu, it is interesting to note that the raising of squabs, or young pigeons, is an important meat-producing industry in the United States and Australia. It is an intensive development of an age-old food supply which in the Middle Ages saw every English country mansion with its own dovecote where hundreds of young pigeons were reared for pigeon-pie. Similar dovecotes produce an important part of the home meat supply in Egypt and Syria today. As a source of meat for canning it has large possibilities.

SEVERAL breeds of pigeon are used for squab raising in America, notably White Kings, Red Carneaux, Swiss and French Mondains, and even giant pigeons. Large breeds like the Maltese also make excellent table pigeons. The French Mondain is the largest of the table pigeons and noted for its size, quick breeding, and quick growth. The reddish-brown Carneau is a smaller bird, and the quick breeding Belgian Mondain is also smaller. Although the American table birds are the smallest, they are the quickest breeders, and so produce the largest number of "crops" of squabs in a year.

The Carneau, a popular breed used at American squab-raising plants.

At Ashford in Kent the Waterside Squab Farm found a cross between the Red Carneau and the American White King produced the most fertile table pigeon. The very large, old, and hardy breed called the Runt makes another suitable table bird.

Squabs are ready for packing when three weeks old, and pigeons will breed in all months of the year. As many as 22,000 pigeons are housed at the world's largest pigeon breeding plant at Sumter, South Carolina, which was established twenty-four years ago with $2,500 capital and forty pairs of pigeons. The first two years' operation of this plant produced no income to the proprietors. It now produces over 100,000 squabs for eating (average weight a pound each), most of which are frozen in a cold storage plant before despatch to the canneries and food stores.

Britain's Climatic Handicaps

The most successful squab-rearing plants in the U.S. are in the warmer States, but large numbers of squabs are sold to commission merchants in Chicago and New York. In this country damp and fog in winter are the main handicaps to continuous pigeon-breeding, although squab weights average considerably heavier in winter than summer, even when rations are the same, chiefly because hot weather makes birds go light. In the hot sub-tropical countries of the East the pigeons are much smaller and lighter than those bred in temperate Britain.

As with forced poultry feeding, squabs are sometimes hand-fed for greater size, but not by the old European method of feeding them from the human mouth. Hand-fed squabs in America weigh two or three pounds more to the dozen than those reared by the pigeons themselves. Fifty dozen squabs are hand-fed at the Sumter plant by one man in less than two hours, using a specially devised hose-nozzle with hair-trigger spring, and a diet of 30 per cent. protein, 33 per cent. carbohydrate, and 25 per cent. fat. With eggs in one nest and squabs in another, the intensive pigeon-breeders in America get a "crop" from their birds every forty-four days, and part-time pocket-money squab raisers commonly have 200 back-garden bird plants.

When to Can Squabs

The squab is available for canning when twenty-five to thirty days old, that is just before it is ready to leave the nest-bowl, when it weighs 15 to 24 oz. Each pair of breeding birds averages ten to fourteen squabs—more by intensive breeding methods already described—for the consumption of 90 to 110 lb. of food.

In this country the main obstacle to squab raising

Squabs from auto-sexing pair. The male has the colouring of the father and the female that of the mother.

for canning is the obtainment of sufficient corn for feeding, but substitute foods can be used to a large extent, although they must be rich in proteins if the pigeons are to reproduce well. The diet is aimed to produce quick-growing, well-fleshed squabs. Cow and field peas, sweet corn, tares, vetch, hempseed, wheat, plus a special mineral mixture of common salt, a little calcium and phosphorous (*e.g.* oyster-shell, limestone, and common salt) are also added, but very little fibre is used.

High Food Values

The food value of squab meat is as high as that of game. The flesh of the young pigeon is richer in soluble protein and has less connective tissue than adult pigeons. American squab meat has a fine texture and a delicious flavour. It is tender and easily digested by elderly people and invalids, hence physicians often recommend it in lieu of chicken.

Not all pigeons are suitable for a squab plant; the breeds already mentioned have proved commercially successful because they fulfil the requirements of quick-breeding and producing quick maturing squabs of good size. If there is a further qualification it is light-coloured skin to meet popular taste. Cross-breeds are frequently used, and there are now available in America auto-sexed crosses of King X Carneaux, and auto-sexed Kings, in which the beak of the female squab and not the male has a pigmentation. Sex-linked matings are not suitable for squab-raising, as most of these matings produce dark-fleshed squabs which are unpopular on the market.

One of the most popular breeds in American squab production is the White King, a prolific pigeon with large, full-breasted squabs of 24 to 28 oz. in twenty-six to twenty-eight days. The French Carneau produces squabs of 21 to 25 oz. (young cocks are generally an ounce heavier than young hens), Swiss Mondains 28 oz., Giant Homers 22 to 27 oz. Several American commercial squab plants use "working homers" no longer required for racing, which produce dressed squabs averaging 9 to 10 lb. to the dozen. But as homers or racing pigeons have a tendency to dark skin, these plants select their stock carefully for white-fleshed birds. In France the famous Bordeaux squabs were produced from Gros Mondains and Belgian Carneaux.

In these American pigeon plants, a good deal of negro labour is employed for stripping, dressing, and grading the squabs; but it is light work suitable for women and girls, like most food packing rooms.

Squab Abattoirs

The large plants have an abattoir or squab-killing building. Ten or eleven coloured women, who pluck the squabs for 3 cents each, handle 1,000 to 1,200 squabs daily. The Palmetto (Sumter) plant has an annual food bill of 120 tons of peas, 100 tons of kaffir or milo, and 90 tons of wheat, and uses 50,000 gal. of water a month. Vermin

Twenty-eight pens and the brick feed building with over three hundred pigeon lofts.

control is an essential part of a business which attracts rats and mice to its premises.

The cork-insulated quick freezing and holding room has a capacity of 30,000 squabs at a temperature from 0° F. to 5° F.

Pigeon squabs are canned in several different forms. For pigeon curry they are fried in halves with minced onions, curry powder, and flour, flavoured with salt, chopped apple, and a little lemon flavouring, using game stock to increase the flavour. Pigeon cutlets may be fried with salt and pepper and browned with flour and then simmered in hot water. They may also be cooked with chopped chestnuts that have been blanched and cooked in water till soft, with a piece of fat bacon added, together with a sauce of boiled and chopped pigeon's liver, chopped parsley, brown sauce, nutmeg, salt, pepper, and lemon flavour. Pigeons *à la Portugaise* are cooked tender and boneless, stuffed with minced veal, ham, or tongue, and pigeons' livers, egg and breadcrumbs, and with sliced turnip, tomatoes, carrot, onion, salt, pepper, and cayenne and herbs. Pupton of pigeons is cooked with asparagus, mushrooms, fat bacon, veal forcemeat, sweetbread and gravy, and ox palate cut small.

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Money in Squabs, by Frank Foy. (U.S.)
National Standard Squab Book, by Elmer C. Rice. (U.S.)
Squab Raising, Bull. 684, U.S. Dept. of Agric., by Alfred R. Lee and S. H. Haynes.
Practical Pigeon Production, by Sheppard K. Haynes, of U.S. Dept. of Agric.
Utility Pigeons, by Elizabeth Lowe.

Food Examination

AN important entity in food examination is the professional food or sanitary inspector, who spends much of his working day examining food shops, restaurants, etc., and taking samples of food for analysis, or suggesting to shopkeepers that it might be in their own interests to surrender damaged goods for destruction. When food control first began to be seriously undertaken by sanitary inspectors, the chances were that it was only a minor part of their duty, and that, before becoming sanitary inspectors, they had undergone their main training as builders, sanitary engineers, etc. It is now essential for anyone hoping to obtain employment as a food inspector to possess the Meat and Other Foods Certificate of the Royal Sanitary Institute, and there are few young food inspectors who do not owe a considerable amount of their theoretical knowledge of the subject to Mr. C. R. A. Martin, formerly Chief Sanitary Inspector, Whitstable, and to his book* on the practical examination of foods which has now reached its third edition. Mr. Martin has produced his book in two volumes, the first dealing solely with meat inspection, which, therefore, might appear to be of no great interest to the average manufacturer. But it is now being recognised that the food manufacturer is concerned with the state of the animal before it is killed and the method by which it is slaughtered, since these affect the condition of the meat for sale or for preservation, especially for the curing of bacon. The author discusses the various common diseases of animals and whether and how far these affect the marketability of the carcasses.

The reviewer would like to emphasise two points which the author makes—the necessity for preslaughter inspection of animals intended for food, and the attendance of sanitary inspectors at cattle markets. The only defects observed in Volume I are the brevity with which the ductless glands are mentioned, the absence of any reference to the pituitary gland or to *Brucella abortus* and its effect on the edibility of meat.

Canned Goods

The second volume is well worth study by the manufacturer, since it contains chapters covering fish, poultry, and game; fruit, vegetables, and cereals; canned foods; milk and milk products; miscellaneous foods; food poisoning; and legal procedure. At the end of each volume there is a short glossary of terms for the benefit of beginners. The chapter on canned goods shows a particularly broad-minded outlook, as many inspectors regard the bulging ends of cans as a sure and necessary sign for their condemnation, whereas Mr. Martin recognises that such defects may be due to the overfilling of cans and does not attach much importance to the presence of a few springers in a large consignment.

So far so good. The last thing the reviewer would wish to do is to decry the usefulness of a book because of a few blemishes, but he cannot help feeling that the shoemaker should stick to his last, and when Mr. Martin attempts to teach chemistry he only illustrates the folly of Local Authorities entrusting this work to the food inspectors, when public analysts, who know so much more about analysis, are available. We learn with surprise that sausage meat requires longer boiling than other meat when examining it for the presence of horseflesh, and that in the presence of starch it is only necessary to add from two to three times the volume of acetic acid to precipitate the starch, filter the solution, and test the filtrate with iodine-potassium iodide solution (Vol. I, p. 6). In testing for the acidity of milk the reader is instructed to add a few drops of phenolphthalein, when the milk assumes a pink colour, and this is then titrated with caustic soda to neutralise the colour! One also learns with amazement that the freezing point of genuine milk is −·55° C., and may be at most −·57° C. If

* *Practical Food Inspection*. By C. R. A. Martin, M.R.San.I., A.M.I.S.E. 2 vols. Vol. I—Meat Inspection. Pp. 316+viii. Vol. II—Fish, Poultry and Other Foods. Pp. 284+viii. London. Price 18s. each.

above this point, *i.e.* nearer the freezing point of water (0° C.), it proves the milk to have been watered.

In his glossary of terms the author is equally unhelpful when he tells us that "ethyl" is grain alcohol and that "fructose" is fruit sugar. It is doubtful whether it is wise to state that "farina" equals a cereal, that "ester" is a combination of alcohol and certain acids, or that "perborates" are boric compounds. Likewise that thermophilic organisms are those which grow at high temperatures rather than those which just live at high temperatures. One hesitates to go into too many details concerning his discussion of miscellaneous foods, but it is a revelation to learn that there are three kinds of vinegar prepared: (1) from fermented grape juice, (2) from malt, or (3) by the destructive distillation of wood. Again it is surprising to learn that the usual adulterants of curry powder are flour and sand, and that baking powders still tend to contain alum.

There are one or two unfortunate misprints—as "infested crustaceans are infested by fresh-water fish" (Vol. II, p. 29), and milk is tested for coliform organisms in "1 c.c., 1/10th, 1/100th, and 1/100th part of a c.c."

It is greatly to be regretted that Mr. Martin did not see fit to ask someone better versed in the chemical and pathological side of the subject than he is to vet the book. Despite all this, *Practical Food Inspection* is the best book on the subject, published in this country, known to the reviewer. When, however, the reader notices obvious faults concerning subjects with which he is familiar, there must arise in his mind doubts as to the authenticity of those of which he is ignorant. It is to be hoped that the author will revise his work in order to establish it as a standard textbook for his colleagues and for others who have to deal with food examination.—T. McL.

Refining and Hardening Vegetable Oils

THE impurities present in crude vegetable oils include free fatty acids, phosphatides, proteins, resins, mucilage, and their decomposition products. On refining with alkaline solutions the free acidity is neutralised, phosphatides and mucilage are rendered insoluble and precipitated by occlusion in the soapstock.

This operation is commonly performed on the batch principle. Continuous refining processes using centrifuges are especially suitable for cottonseed oil. The short period of contact between oil and lye, and efficient separation of oil and soapstock, results in lower losses than by batch methods. The Clayton soda-ash process, while more complicated than the continuous caustic soda process, is still more efficient and likely to supersede the other.

After removal of residual soapstock by washing, settling, or filtration through spent cake, the oil is bleached. The colour of the bleached oil may be determined by comparison with Lovibond standard glasses, or measurement of light transmission by spectrophotometer.

Batch deodorisers vary in design but consist primarily of a cylindrical vessel with heating and cooling coils, with a wide vapour outlet communicating with barometric condenser. Heating is accomplished by high-pressure steam or Dowtherm vapour. The rate and efficiency of deodorisation are influenced by temperature of oil charge, rate of blowing steam, and absolute pressure in the vessel. A continuous deodoriser on the tower principle has been developed in U.S.A., and recently a semi-continuous deodoriser has been devised in which the oil progresses through a series of trays, mounted vertically in a cylindrical shell, at half-hour intervals.

In hardening plants of moderate capacity the hydrogen supply is most conveniently obtained by the electrolytic process, employing cells or filter-press type electrolysers. The gas cost is dependent on the price of power and value of the by-product oxygen, but is more or less constant at any rate of production. In larger plants it is usually more economical to obtain hydrogen by the steam-iron process Water gas is obtained by the reaction of coke and steam, and is used for the reduction of iron oxide to iron, which in turn reacts with superheated steam to liberate hydrogen. In the United States pure hydrogen is also obtained by the reaction of hydrocarbons, such as propane, with steam in the presence of a catalyst.

Nickel catalyst is obtained by dry reduction of nickel carbonate, by thermal decomposition of nickel formate suspended in oil, or by wet-reduction of nickel and copper carbonates in oil.

Hydrogenation is conducted in vessels equipped with heating and cooling coils, agitator, safety valves, etc. The conditions of temperature, pressure, catalyst proportion, and activity have an important influence on the selectivity of hydrogenation and on the formation of iso-oleic acids. The operation is controlled by measurement of iodine value, refractive index, melting point, and dilatation of the hardened fat.

Abstract of the paper presented by Alexander Arneil, B.Sc., A.R.T.C., A.R.I.C., at the Edinburgh meeting of the Society of Chemical Industry. July, 1948.

TO AUTHORS

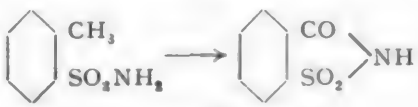
FOOD MANUFACTURE is prepared to consider the publication of any books on scientific and technical subjects which authors might care to submit.

The Sweetness of Synthetics

R. W. MONCRIEFF, B.Sc., F.R.I.C.

Since the discovery in 1879 of saccharin by Remsen and Fahlberg[1] the search for synthetic sweetening agents has been prosecuted with enthusiasm. It is a curious fact that although the initial discovery of saccharin was made almost fortuitously, the next fifty years of research, in which the aim was avowedly to discover substances even sweeter than saccharin, failed to reveal the existence of any such substances.

REMSEN and Fahlberg were carrying out an investigation of the oxidation products of various aromatic compounds, and Fahlberg, after working in the laboratory all day, noticed that the bread he was eating with his supper tasted sweet. He traced the sweet taste to his arms, concluded that it must have come from one of the chemicals with which he was working, returned to the laboratory and traced the taste to the products resulting from the oxidation of *o*-toluene sulphonamide which formed the sweet substance saccharin in this way:



Toluene sulphonamide Saccharin

Various figures have been given for the sweetness of saccharin relative to that of sugar (sucrose); these have ranged from 400 to 700, and there seems little doubt that the relative sweetness varies with the concentration used, *i.e.* sweetness and concentration are not linearly proportional. Probably the best representative figure is 550.

The next important synthetic sweetener discovered was *p*-ethoxyphenyl urea or dulcin, which has a sweetness about 200 times that of sucrose. It seems to have first aroused serious interest in Germany in the First World War, and in 1916 it was reported[2] to be harmless to animals and man and to be free from the bitter after-taste which saccharin possesses.

Safety of Saccharin

From time to time doubts have been thrown on the safety of saccharin, and extensive trials have been carried out in which large quantities have been fed to dogs over a period of three months. While in some cases undesirable symptoms have developed, such researches have shown that the quantities likely to be ingested in the form of sweetener from a reasonably normal diet are quite harmless to man. The quantity of 0·3 grams has been suggested as a safe limit for human daily consumption above which harmful results may ensue, but this is considerably in excess of any likely intake of saccharin. Staub[3] has shown that in large amounts saccharin produces gastro-intestinal disturbances, and that dulcin is slightly more toxic than saccharin, but in quantities commonly required for sweetening beverages, jam, and fruit, no untoward results are likely to ensue even after prolonged use.

Additive Sweetness

It was observed by Paul[4] that whereas the sweetness of mixtures of sugars was normally equal to the sum of the sweetness of the components, yet the sweetness of saccharin was increased out of all proportion by the addition of dulcin; mixtures of saccharin and dulcin gave anomalously high figures of sweetness. More recently Kroll[5] has stated that dulcin enhances the sweetness of saccharin when used in hot beverages, and that the taste of saccharin and dulcin is additive to that of sucrose. Cameron[6] also has stated that the sweetness of one sugar is enhanced by the presence of a second sugar, and he has adduced evidence that α-d-glucose is sweeter than the β-form.

Effects of Dilution on Relative Sweetness

Cameron[7] determined the sweetnesses of various concentrations of several sugars and of glycerol, using trained tasters and the dairy-tasting technique. He showed that the following solutions were equally sweet:

1.	2·0	per cent.	sucrose	and	3·8	per cent.	glucose		
2.	10·0	,,	,,	,,	,,	14·7	,,	,,	,,
3.	20·0	,,	,,	,,	,,	25·0	,,	,,	,,
4.	2·0	,,	,,	,,	,,	6·5	,,	,,	lactose
5.	5·0	,,	,,	,,	,,	14·9	,,	,,	,,
6.	8·0	,,	,,	,,	,,	21·7	,,	,,	,,
7.	2·25	,,	,,	,,	,,	4·0	,,	,,	glycerol
8.	5·5	,,	,,	,,	,,	8·0	,,	,,	,,
9.	8·9	,,	,,	,,	,,	12·0	,,	,,	,,

It will be seen that there is no constant linear relationship between concentration and sweetness, that in fact the relative sweetness changes with dilution. Paul[8] earlier had reported that the sweet-

ness of saccharin relative to that of sucrose decreased with increasing concentration of the solution. Cameron has derived a mathematical method for calculating the sweetness of a mixture of sugars of known composition in terms of that of a specific concentration of sucrose. Dahlberg and Penczek[9] have recently reported that the sweetness of various sugars relative to that of sucrose varies directly with the concentration, but that levulose constitutes an exception as its sweetness is nearly twice as great in high concentrations as it is in low.

Use of Saccharin and Dulcin

According to Adam[10] saccharin 550 or soluble saccharin can be used to increase the sweetness of canned fruits without introducing any foreign flavour, and in the case of canned peas can satisfactorily replace *all* the sugar, without any serious effect on the flavour, but is unsuitable for use with canned beans in tomatoes. Dulcin can be used similarly, and is stated to be better than saccharin to increase the sweetness of canned fruits, and although it is good also in peas, like saccharin it is unsuitable to use with beans in tomato sauce.

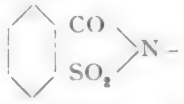
Erb[11] has discussed the use of synthetic sweetness in ice cream.

Changes in Constitution of Saccharin

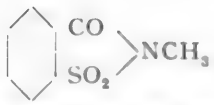
Innumerable modifications have been made to the saccharin molecule in order to enhance its sweetness. When the heterocyclic system is doubled to give $C_6H_2(SO_2CONH)_2$ bitter products result.[12] Even when the saccharin molecule is combined with a dulcin molecule the resulting compound

saccharin - 2 - *p* - ethoxyformanilide has no sweet taste.[13] Many other similar combinations and rearrangements have been attempted, and in most cases there is no sweet taste at all, while in no case is any compound comparable to saccharin in sweetness produced. A review of these devices is to be found in "The Chemical Senses."[14]

Most of the salts of saccharin are sweet, notably the sodium and ammonium salts, both intensely sweet, and it is likely that the sweetness normally observed is due to the anion



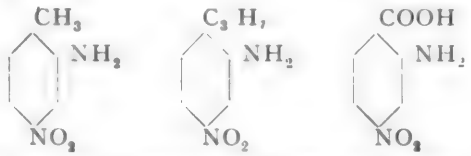
and this is borne out by the fact that N-methyl saccharin and the corresponding ethyl, bromethyl, hydroxymethyl, and phenyl substituted compounds, in which ionisation would be impossible, are tasteless, *e.g.*



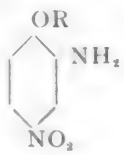
Mannessier-Mameli,[15] who has contributed a great deal of work on the subject of sweetness, has shown that the semicarbazide of saccharin has no sweet taste, an observation that confirms earlier inferences that derivatives such as the oxime of saccharin, which have retained the isothiazole nucleus but have lost carbonyl oxygen atom, are without sweet taste. Substitution of halogens or alkyl groups in the benzene ring of saccharin does not destroy, although it reduces, the sweet taste of saccharin, but few liberties can be taken with the heterocyclic ring. It is clear that the intense sweetness is associated with some special molecular arrangement which can very easily be disturbed.

The Nitramines

The nitramines provide more evidence and even more striking evidence that intense sweetness is associated with some very finely balanced molecular architecture. It has long been known that *m*-nitraniline is sweet, and in 1916 von Braun[16] and his colleagues published the results of investigations in the taste variations of substituted nitramines. Generally they found that the introduction of an alkyl or even an acid group *para* to the nitro-group gave a sweet compound, *e.g.* the following were sweet

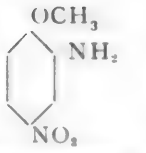


More recently Blanksma and van der Weyden,[17] while investigating the substituted nitramines, discovered one compound with the colossal sweetness of 3,000 to 4,000 times that of sucrose. They found that the compounds in which an alkoxy group was substituted *para* to the nitro group were all sweet. They were of the type

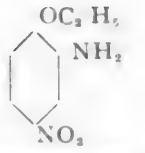


and when the substituted group was propoxy ($R = C_3H_7$) the compound had a sweetness of 3,300 times that of sucrose.

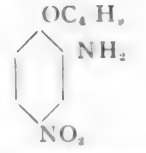
According to a more recent paper by Verkade, van Dijk, and Meerburg,[18] the sweetness of this substance is 4,100 times that of sucrose and other closely related bodies are also extremely sweet. Some of these are



220 × sucrose

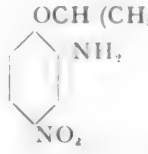


950 × sucrose

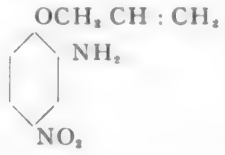


1,000 × sucrose

It is clear that sweetness reaches a maximum with the propyl substituent, falling off on each side either to the ethyl or butyl derivative. The isopropoxy derivative



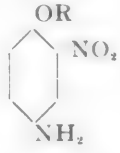
is only 600 times as sweet as sugar. Very surprisingly, the allyloxy compound



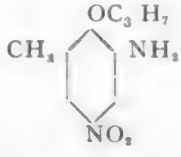
has a sweetness of 2,000 times that of sucrose. This is surprising because the unsaturation would be expected to introduce an acrid note.

Compounds higher than the butoxy derivative could not be studied for sweetness owing to their insolubility. The acetyl derivatives (acetyl group substituted in amino group) are hardly sweet,[19] and as their 0·01 per cent. solutions produce no impression they are evidently less than twenty-five times as sweet as sucrose.

Several workers have confirmed that the corresponding isomers



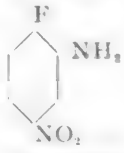
are all bitter or tasteless, and this is a remarkable illustration of the susceptibility of the sweetness characteristic to slight changes in molecular architecture; 2,4 amino nitro propoxybenzene is the sweetest substance known, and yet 2,4 nitro amino propoxybenzene is bitter. The compound 1-propoxy-2-amino-4-nitro-6-methyl benzene



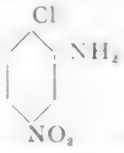
is sweet, 310 times as sweet as sucrose. In all these compounds, which have the 2-amino-4-nitro configuration, the taste is purely sweet, and there is no after-taste.

Halogen Substituted Nitramines

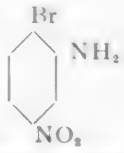
The influence on the sweetness of the substitution of halogens in nitramines has been investigated by Blanksma, van den Broek, and Hoegen[20] at Leyden. The following compounds indicate the lines on which their findings run:



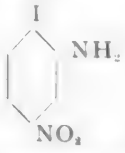
40 × sucrose



400 × sucrose



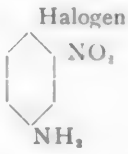
800 × sucrose



1250 × sucrose

It is clear that the substitution of a halogen atom for the alkoxy group has been attended by a loss in sweetness, but even so the sweetness of these compounds is remarkable. The progressive rise in degree of sweetness with increasing molecular weight of the halogen substituent is noteworthy, but molecular weight is not the only consideration involved since the molecular weight of the propoxy group is only fifty-nine, and this represents the optimum value in the alkoxy nitramine, but in the halo nitramines the sweetness appears to increase with increase in molecular weight throughout the series.

The corresponding acetyl derivatives are tasteless and evidently once again the sweetness is very sensitive to change in molecular structure. The corresponding isomeric bodies



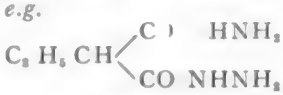
in which the halogen atom is *para* to the amine group, instead of to the nitro group, are tasteless.

It is interesting to note that the use of *m*-nitraniline derivatives substituted in the position *para* to the nitro group has been protected by patent.[21] The salts of these bodies are also included in the patent specification. Apparently the products may be prepared by partial reduction of substituted 1,3-dinitrobenzenes.

In another paper Verkade and his collaborators[22] report that the sweet nitramines all have some local anaesthetic action, and that the sweetest known member, the propoxy derivative, is thirty times as potent as cocaine.

Hydrazides

Chemically, hydrazides bear the same relation to amides as hydrazine NH_2NH_2 does to ammonia NH_3. de Graaf[23] appears first to have noticed that the hydrazides of malonic and substituted malonic acids had intensely sweet tastes. The first five members of the series, viz. malonic dihydrazide, methyl, ethyl, propyl, and isopropyl malonic dihydrazides, *e.g.*

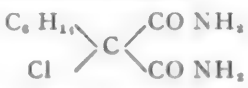


are all sweet, but the next member, butyl malonic dihydrazide, is bitter. It would appear that the hydrazine group is evidently responsible for the sweetness, and yet the introduction of a third hydrazine group into the molecule gives the substance $NH_2NHCH(CONHNH_2)_2$, which is tasteless. The dihydrazide of succinic acid is also very sweet, but as hydroxyl groups are introduced into the molecule the sweetness progressively diminishes; for malic dihydrazide (one hydroxyl group) is sweet, although less sweet than succinic dihydrazide, tartaric dihydrazide (two hydroxyl groups) is only slightly sweet, and mucic dihydrazide (four hydroxyl groups) is not sweet at all.

Not all dihydrazides accordingly are sweet, although many of them are. Monohydrazides are not sweet, and according to Blanksma and Bakels[24] two hydrazide groups located near to each other are necessary for the production of a sweet taste.

Malonamides

Some of the malonic amides are also very sweet, notably hexyl chlormalonamide



which Dox and Houston[25] reported to be 300 times as sweet as sucrose, and later Dox and Jones[26] reported that the corresponding amyl derivative was 400 times as sweet as sugar. The isoamyl derivative was bitter, another illustration of the great sensitivity of the property of sweetness to change in molecular architecture. This peculiar sensitivity makes research into the relation between constitution and sweetness very difficult. What happens as a rule is that the sweetness of a synthetic is discovered by chance, and systematic investigation shows that its near homologues also have sweet tastes, but that any other substances in which significant changes are made to the molecular arrangement are often tasteless or even bitter. As an illustration the effect of the introduction of hydroxyl groups into the structure represented by succinic dihydrazide should be studied; there is a progressive reduction in sweetness, and yet the hydroxyl groups are those commonly associated with the production of sweetness in the commonest sweetening materials used such as the natural sugars, glycerol, and the glycols. It may be mentioned here that propylene glycol has been recommended[27] as a flavour solvent as a replacement for the highly taxed ethyl alcohol.

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BOOKS RECEIVED

Orders for any of the books listed below or reviewed in this issue may be placed with the Books Department, FOOD MANUFACTURE, 17, Stratford Place, London, W.1. It is regretted that under present conditions it is not always possible to supply books by return of post.

The Book of Sauces. By Ambrose Heath. Pp. 228. London. Price 7s. 6d.

Human Nutrition. By V. H. Mottram, M.A. (Cantab.). Pp. 267. London. Price 6s. 6d.

News from the Industry

FORTHCOMING EVENTS

Royal Society of Arts

The following meetings for the 195th session, 1948-1949, of the Royal Society of Arts will be held on Wednesdays at 2.30 p.m.:

Jan. 19. "The Industrial Designer and Consumer Goods." Milner Gray, R.D.I., President, Society of Industrial Artists.

Jan 26. "The Application of Science to Fruit Growing." Gordon Swarbrick, M.Sc., Ph.D., of the Long Ashton Research Station, Bristol.

Feb. 2. "The Industrial Designer's Responsibility." Gordon Russell, C.B.E., M.C., R.D.I., F.S.I.A., Master, Faculty of Royal Designers for Industry, and Director, Council of Industrial Design.

Feb. 16. "The Training of the Industrial Designer." Robin Darwin, Hon.A.R.C.A., Principal, Royal College of Art.

Feb. 23. "Training for Agriculture." Dunstan Skilbeck, M.A., Principal, Wye College.

Mar. 2. "British Industrial Design and World Markets." John Gloag, Hon.A.R.I.B.A., Member of the Council of the Society.

These meetings, with the exception of those on January 26 and February 23, are part of a series in connexion with the "Design at Work" Exhibition.

The Nation's Manufactured Foods

A new series of meetings for discussing the problems affecting the nation's manufactured foods is to be inaugurated by the Nutrition Panel of the Food Group of the Society of Chemical Industry.

The first of the meetings will be held on January 5, 1949, at Gas Industry House, 1, Grosvenor Place, London, S.W.1, at 6.30 p.m., and the subject will be "The Sausage as Food." The first paper, entitled "The History of Sausages," will be given by Mr. H. P. Blunt of the Ministry of Food. A second paper on "The Composition of Fresh Sausages" will be read by Mr. Osman Jones, after which Mr. M. G. Read will speak on "The Composition of Processed Sausages." Finally, the chairman of the Panel, Dr. Magnus Pyke, will review these papers and, in his summary on "Sausages and Nutrition," will bring into focus the contribution that sausages can make to the diet.

At the conclusion a general discussion will be held and in order that it may be directed along constructive lines, all those who contemplate contributing to the discussion are asked to send their names to the hon. secretary of the Panel, together with an indication of the points on which they wish to speak. At this, as at subsequent meetings, visitors will be welcome.

Modern Food Technology Course

Some of the outstanding features of modern methods of food preparation and preservation will be dealt with in a course of twelve lectures which will take place on Friday evenings from 6.30 p.m. to 9 p.m. at East Ham Technical College, Barking Road, London, E. 6, commencing January 14, 1949. Entitled "Some Aspects of Modern Food Technology," the course, which will be delivered by L. S. Bull, B.Sc., F.R.I.C., will include the following topics:

Canning and similar means of preservation.

Refrigeration, including quick freezing processes.

Dehydration of meat, vegetables, and other foodstuffs.

Purified and synthetic food materials.

New methods of cooking by gas, oil, electricity, and electronic heating.

Each lecture will be of one hour's duration and will be followed by discussion, demonstration or laboratory tests.

Application for admission to the course should be made *by post* not later than January 7 and should be accompanied by the fee of 10s. Further particulars can be had on application to the Head of the College Department of Science.

British Association of Chemists

The 1949 programme of the British Association of Chemists is as follows:

Jan. 26. "Antibiotics." F. A. Robinson, M.Sc., F.R.I.C.

Mar. 2. B.A.C. Forum.

Mar. 31. "Part-time Education for Chemists." Joint meeting with Royal Institute of Chemistry and the Association of Scientific Workers.

Agriculture Group of the S.C.I.

The 1948-1949 syllabus of the Agriculture Group of the Society of Chemical Industry concludes with the following meetings:

Apr. 19. "The Chemistry of Ensilage." Professor S. J. Watson, Edinburgh and East of Scotland College of Agriculture. 2.30 p.m. in the Chemistry Department of the Royal College of Science.

May 7. "The Scientific Basis of Cheese-making." Dr. J. G. Davis, Express Dairy Co., Ltd., 2.30 p.m. in the Chemistry Department of the Royal College of Science.

June 11. Summer meeting at the Experimental and Research Station, Cheshunt, by kind permission of the Director, Dr. W. F. Bewley, C.B.E.

London Section of the S.C.I.

Jan. 19. Joint meeting with the Plastics Group. Jubilee Memorial Lecture. "Synthetic Fibres. Historical Survey of the Development of some Synthetic Fibrous Materials." H. V. Potter, B.Sc., F.R.I.C., M.I.Chem.E. 6.30 p.m. at the Royal Institution.

Feb. 2. Joint meeting with Portsmouth and District Chemical Society, etc. "Food Science in Evolution." Dr. L. H. Lampitt, F.R.I.C., M.I.Chem.E. 7 p.m. at Portsmouth Municipal College.

Feb. 14. "Cosmetics." Dr. R. H. Marriott, F.R.I.C. 6.30 p.m. at the London School of Hygiene and Tropical Medicine.

Mar. 4. Joint Meeting with the London Group, Industrial Applications Section of the Royal Statistical Society. "The Use of Factorial Experiment for Investigating Chemical Processes." K. A. Brownlee, M.A. 6 p.m. at E.L.M.A. Lighting Service Bureau, 2, Savoy Hill, London, W.C.2.

Mar. 7. "The Physical Chemistry of Dyeing." Dr. T. Vickerstaff, M.Sc., A.R.I.C. 6.30 p.m. at the London School of Hygiene and Tropical Medicine.

Apr. 4. Joint meeting with the London and South-Eastern Counties Section of the Royal Institute of Chemistry. "Recent Developments in Explosives." Dr. A. Forster, O.B.E. 6.30 p.m. at the London School of Hygiene and Tropical Medicine.

May 2. "Leather: The Scientific Background to a Traditional Industry." Dr. M. P. Balfe, B.A., F.R.I.C. 6.30 p.m. at the London School of Hygiene and Tropical Medicine.

Electricity in Safe Hands

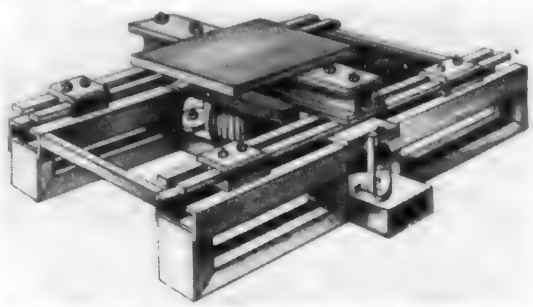
In pursuit of their drive to ensure that electrical installation work is carried out only by qualified people, the N.E.C.T.A., Ltd. (one of the associated organisations representing electrical installation contractors), has offered to guarantee the work of any of its members up to the sum of £500 against bad workmanship or materials. The members of the Association, which is associated with the Electrical Contractors' Association (Incorporated), carry out every type of installation work, and a vigorous publicity campaign, based on the "Safe Hands" symbol, is at present in progress to persuade the user that work by qualified people, independently guaranteed, is in his own interest.

Research Type Vibrating Table

Specifically developed for research and experimental work on vibration phenomena, a vibrating table shown at the Public Health and Municipal Engineering Exhibition is constructed of welded steel units and powered by electromagnets in conjunction with leaf springs on which the vibrating element floats. These springs can be tuned to resonate with the impulses of the magnetic system over a wide range of loadings and frequencies.

The table is equipped with an optical lever for amplitude measurement and when supplied from an amplifier associated with a heat frequency oscillator it can be operated over a wide range of frequencies.

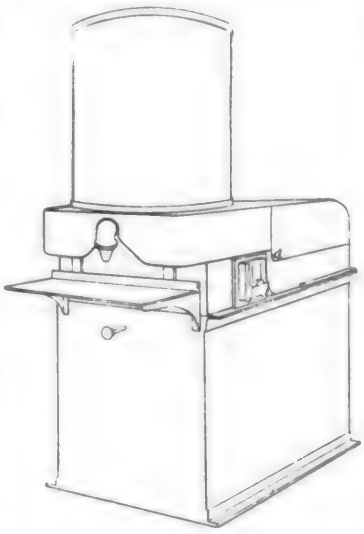
The table was designed in accordance with the Stewart Patents, and produced by Westool, Ltd., for use in the packing of powder and granular materials, the de-aeration of semi-fluid and fluid-solid mixtures; in fact, it has an application in all fields of research where vibration at frequencies varying from 2,000-18,000 cycles per minute are required.



Vibrating table for use in the packing of powder and granular materials.

Pressure Filling Machine

A new filling machine, recently developed by Valley Products (Lye), Ltd., fills soft pastes, creams, sauces, mayonnaise, honey, and other products into any kind of container, premeasures any quantity up to 16 fl. oz., and discharges at a high speed under pressure. Originally designed for filling sandwich spread into waxboard containers



where vacuum was impossible, the machine is also quite suitable for jars, bottles, or tins, and the prototype has achieved the filling of 14 oz. of sandwich spread at 40 fillings per minute. The hopper, cylinder, and other parts coming into contact with the foodstuff can be made of stainless steel or Monel metal, and all sheet metal guards are made of the latter material.

Fomenting Provincial Trade

Mr. J. F. Noble, London sales representative of T. Harrison and Co., Ltd., manufacturers of oils and flavouring compounds, is to make periodical visits to the provinces and he hopes to make fresh contacts as well as renew old acquaintances of the firm.

Co-operative Quick Freezing

Following earlier indications that this region was to be developed as a major fruit growing and processing area under the auspices of the Scottish Council (Development and Industry), it has been announced that a quick freezing plant is to be established in or near Elgin in north-east Scotland to handle the fruit produced. Steps are being taken to form a growers' association and to hasten plans for development.

These plans are of considerable interest to the fishing industry in this region in view of the possibility of co-operation between the two industries so as to provide continuous supplies for the quick freezing plant.

R.I.C. London Section, Annual Report

Reference was made in the 1947 report of the London and South Eastern Counties Section of the Royal Institute of Chemistry to the programme of expansion undertaken by the committee. The annual report for 1948 states that this programme has been continued during the year under review and has been assisted by the work of the Development Subcommittee, acting with local committees or organisers. The possibility of local organisation was discussed at several centres and, arising out of a meeting at Southampton, the Mid-Southern Counties Section of the Institute has already been formed. An account of the many meetings which catered for every kind of chemical interest in the Section area is given, as well as a list of visits and social activities which have taken place. The report also includes some notes on relations with other societies, finance, publicity, membership, and matters of professional interest.

Obituary

Mr. R. Murdin Drake, O.B.E., M.Sc., F.R.I.C., joint manager of the Association of British Chemical Manufacturers.

*

Lord Palmer, at the age of ninety, director of Huntley and Palmers, Ltd.

In 1896, as Mr. Samuel Ernest Palmer, he became a director of the Great Western Railway and was deputy chairman from 1906 to 1943. He was created a baronet in 1916 and in 1921 was elected first Fellow of the Royal College of Music.

*

Sir Thomas George Jones, K.B.E., Chief Divisional Food Officer for Wales, Midland and North-Western Divisions until 1945, died on November 30, at the age of sixty-seven.

Until the 1914-1918 war he was engaged in business in his native Wales, but after the outbreak of war was drawn more and more into the organisation for combating the shortage of food due to the German submarine campaign. In 1917 he joined the Ministry of Food as director of ships' stores and thereafter had much to do with Government policy in the distribution of food in England and Wales.

From 1921 to 1936 he was a divisional food officer under the food department of the Board of Trade, and from the latter year until the outbreak of war had a great deal to do with the shaping of food defence plans. During the 1939-1945 war he served as divisional food officer, first for South Wales and Monmouthshire and from 1941 for the whole of Wales and for the North-Western and Midland areas of England as well.

New Headquarters

Mr. S. B. Hainsworth, managing director of J. H. Fenner and Co., Ltd., and associated companies, has moved his headquarters from the company's factory at Winewall Mill, Colne, Lancashire, to the new factory at Marfleet, Hull.

*

Larger and better equipped premises have been acquired by D. Trapow and Co., Ltd., manufacturers of the Newman labelling machine, at 113, Regent's Park Road, London, N.W. 1.

Weights and Measures

The Board of Trade Committee which is reviewing Weights and Measures legislation has asked a number of interested trading, administrative, and scientific organisations to submit their views on a questionnaire embodying the subjects which the Committee will consider. Any persons or organisations who have not received this questionnaire and who wish to submit representations on any aspects of Weights and Measures legislation are asked to write to the secretary of the Committee, Board of Trade, Millbank, London, S.W. 1, for a copy.

Margarine Plant for Italy

A complete margarine plant with modern equipment with laboratory included is to be shipped to an Italian company. Representatives of the company, Nicolis Fratelli of Verona, flew over to this country recently to conclude the contract with Bamag, Ltd., who are planning the whole factory layout, flow of materials, buildings, etc.

The oil will be refined by a semi-continuous process and then hardened by the nickel formate process, hydrogen being supplied from an electrolyser. The hardened oil will then be filtered and again refined and finally deodorised at an elevated temperature under a vacuum of less than 8 mm. mercury. After the oil is cooled and put through the polishing press it will be stored in a number of tanks according to its characteristics. The various oils and fats will then be carefully weighed, mixed, and emulsified with fresh milk prepared in specially designed milk ripening equipment and chilled over a margarine drum. After continuous kneading, the material will finally be packed automatically into cartons and then into boxes for distribution.

Changes of Address

The address of the British Chemical Plant Manufacturers' Association is now 14, Suffolk Street, London, S.W. 1.

*

The London office of Woods of Colchester, Ltd., is now at Fenwick House, 292, High Holborn, London, W.C. 1. Telephone: Chancery 8284 and Holborn 1381.

Changes in Export Licensing Control

Changes in Export Licensing Control are made by a Board of Trade Order which came into operation on November 26, 1948.

Among those goods which do not now require export licences are beer, lactose, and certain plastic materials. Licences are now required for beryllium in some forms and further types of scientific equipment.

The changes in the Schedule are given below:

Group 1—The item "Beer" is added to the list of exclusions in the heading relating to beverages; the item "Lactose" is deleted.

Group 6(1)—Beryllium is added to the list of items under the headings relating to non-ferrous metals and alloys, and ores and concentrates.

Group 8—The item "polymers of vinyl chloride, co-polymers made mainly from vinyl or polyvinyl chloride, and compositions consisting mainly of any of these materials, in the form of rough sheet, strip, powder, granules, or chips" is deleted.

Group 15—A list of scientific equipment is inserted.

Sig. A. Minghetti; Mr. L. Barton, Bamag, Ltd.; Sig. E. Nicolis; Mr. M. K. Schwitzer, Bamag, Ltd.; Sig. T. Nicolis, President of Nicolis Fratelli; Sig. D'Este.

British Council Conference Grants

The British Council has a small fund to enable overseas delegates who cannot otherwise arrange to come to this country to attend national or international conferences held in the United Kingdom on scientific subjects including agriculture, engineering, and medicine.

Grants are paid to overseas delegates in person and cover subsistence in the United Kingdom for the duration of the conference up to a period of two weeks. Fares to and from the United Kingdom can be paid only in exceptional circumstances, and no payment can be made to the convening body to cover their secretarial or other organising expenses.

Conveners of conferences to be held during the period April 1, 1949, to March 31, 1950, should apply to the Director, Visitors' Department, British Council, 3, Hanover Street, W. 1, by January 15, 1949, giving particulars of their conference and the number of delegates (and their nationalities) who they think will require assistance. Where it is impossible for conveners to apply by January 15, they may apply later upon the understanding that funds may no longer be available.

Applications will be considered by the relevant British Council Advisory Panel of Scientific Experts and conference conveners will receive a reply by the end of February, 1949.

Re-opening of Pearlite Box Co., Ltd.

The new head office and London factory of Pearlite Box Co., Ltd., at West Road, Tottenham, which was closed through fire on November 11, 1946, was opened on November 26 by Lord Morrison, Parliamentary Secretary to the Ministry of Works.

Mr. Douglas James, O.B.E., chairman and managing director, spoke of it being a very happy and joyous occasion. He said that the last two years had been exceedingly strenuous for him. He had supervised the building of not only the new factory at Tottenham, but also the firm's new premises at Manchester. "The new premises," he said, "are an example of what a factory should be." He spoke of the happy family spirit which existed between management and employees. The firm had tried to give their workers ideal surroundings and conditions in which to work. There was modern lighting approximating natural light, cloakrooms with drying facilities, and an excellent canteen. They had done this, not only for the comfort and welfare of workers, but also to get efficiency in production, greater production and cheaper production.

Lord Morrison said his Ministry had supported the Pearlite application for building materials because the firm was essential to the food trade. Government Departments did sometimes act quickly and wisely. They had been convinced that this was an industry which should be encouraged and set on its feet as quickly as possible.

He suggested that an industrial exhibition should be staged in Tottenham, to let the people know the wide variety of products which were manufactured locally. He then declared the factory open.

Mr. Philip Walker, A.C.A., a director of the company, said he had no doubt that a large part of the energy expended on the project was spent in filling up pink forms and sending them to the appropriate department. They had been able to maintain production because of the kindness of Dailley and Co., Ltd.

As a token of what were called "those two happy years of co-operation" Mr. James presented Dailley and Co., Ltd., with an inscribed plaque, and several presentations were then made to people prominently associated with the re-building.

Additional Food Allocations

PROTEST AGAINST DISCRIMINATORY METHODS

Following the announcement by the Minister of Food of his intention to use discriminatory methods in allocating additional sugar and other foods to manufacturers and distributors of certain foodstuffs, the Federation of British Industries have been authorised by the following organisations to issue this statement, with which they unanimously agree :

Association of British Chambers of Commerce.
British Cake and Biscuit Association.
Cocoa, Chocolate, and Confectionery Alliance, Ltd.
Federation of British Industries.
Federation of Wholesale and Multiple Bakers.
Food Manufacturers' Federation.
Multiple Shops Federation.
National Association of Master Bakers, Confectioners, and Caterers.
National Association of Multiple Grocers.
National Federation of Grocers and Provision Dealers' Associations.
National Federation of Wholesale Grocers and Provision Merchants Associations.

The organisations reject completely the extension of any methods which attempt to link the manufacture or distribution of unrationed foodstuffs to the manufacture or distribution of rationed foodstuffs. Consumer demand for the latter cannot be taken as a measure of demand for the former.

They reject with equal emphasis attempts to regiment consumer choice, which stultify the efforts being made by productive industry to secure increased efficiency and service.

Representations have already been made to the Minister indicating an anxiety to examine, with him, methods of revising allocations in the interests of efficiency. Some successful new methods are already in operation; others are in an experimental stage, but there is no standard solution suitable for all sections of the food industry. The Minister appears to have overlooked the clear undertakings he has given not to change allocation methods without consultation with the organisations.

Discriminatory allocation of sugar, etc., must inevitably lead to claims for similar treatment in other controlled materials comprised in the products affected, otherwise it will produce no increase of output.

The organisations therefore protest most vigorously against the Minister's announcement, and request that the matter be reviewed in consultation with the interests affected.

Scottish Experimental Farm

Government support is being requested for the development of a farm for experimental beef production at Balnastraid, near Dinnet in the north of Scotland. Experiments will be confined largely to best methods of feeding.

Printing and Packaging Research

The report of the Council, dealing with matters of administration, finance, membership, etc., and the report of the Director of Research, together with a list of members, comprise the annual report for 1947-1948 of the Printing, Packaging, and Allied Trades Research Association. The services of the information bureau have been extensively used and *ad hoc* investigations carried out for members have again increased, while the activities of the packaging division are to be extended by the provision of a package testing service to carry out performance tests on packages on behalf of individual firms.

The new laboratories provided by the Association will enable staff to deal with the comprehensive research programme drawn up through the Advisory Panels which, it is believed, will make a valuable contribution to the technical progress of the printing and packaging industries.

Research Association Elections

At a group meeting of members of the British Baking Industries' Research Association held in Glasgow recently, Mr. J. McMillan was re-elected as their representative on the Council of the Association. Mr. McMillan was co-opted to the Council to fill the vacancy caused by the resignation of Mr. J. R. MacLeod. The meeting, which was well attended, was addressed by Dr. J. B. M. Coppock, the Director of Research, on the present work of the Association.

At another group meeting of members carrying on business in Wales, Mr. R. McLeish was unanimously elected their representative on the Council to fill the vacancy arising from the retirement of Mr. G. Franklin, who had been a member of the Council since the inception of the Association.

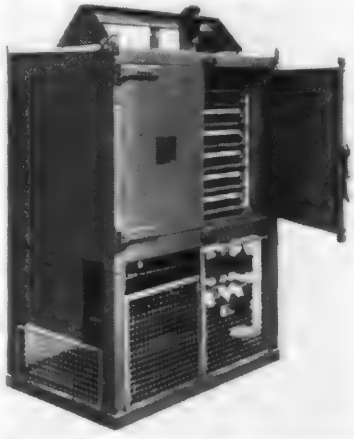
Instrument Company's Move

An immediate increase in production far in excess of the capacity of their London works is made possible by the removal of Bristol's Instrument Co., Ltd., to a new factory at Weymouth, Dorset. The design, layout, and equipment in general is of an advanced nature, and every modern facility has been used to assist in the highly specialised work of the company. The factory manufactures a complete range of recording and controlling gauges, thermometers, liquid level instruments, potentiometers, and process cycle controllers; together with an entirely new range of flowmeters.

A portion of the company's former premises is being maintained as a London office, but all manufacturing and administrative functions take place at Weymouth where the head office is located.

Quick Freezing Afloat

Six double-contact plate quick freezing machines containing eighteen freezing trays, each capable of taking 21 lb. of fish fillets (complete load 378 lb.), have been installed on the *Polarkist*, a floating factory ship operated by Det Norske Fiskefilet Kompani of Trondheim. These machines are manufactured by Jackstone Froster, Ltd. Two other machines have been installed on the *Greenland*, a Danish vessel, and one on the Norwegian Government whaling vessel *Thorshavet*.



A double-contact plate quick freezing machine.

Design in Industry

Approximately ninety guests heard Mrs. C. M. Wakeman, M.Sc., speak on "The Carton and the Chemist" at a packaging conference arranged by Boxfoldia, Ltd., held on November 25 at Manchester. The talk after luncheon on "The Designer's Function" was given by Mr. Milner Gray, President of the Society of Industrial Artists, who, as one of the Royal Designers for Industry, was among those whose work was included in the Design At Work Exhibition shown at the Royal Academy.

Cheshire's New Canning Factory

The products of a new factory opened at Seacombe by United Canners, Ltd., are to be earmarked for residents in Lancashire and Cheshire. The new works, which will receive their supplies from Lancashire farms, are engaged on the canning of peas at present, but it is hoped to commence the production of canned jams, fruits, and vegetables in the near future. Sixty workers are employed, producing 4,000 tins an hour, but this figure will eventually be increased to 15,000 tins an hour.

Fish Smoked by Electricity

An important development in fish curing practice involving the adoption of an electrically operated smoking kiln which smokes both haddock and herring in two hours has been invented by an Aberdeen engineer.

The electrical equipment and firebox are below the cabinet, which takes six tenters, each holding ten fish, and the fire is set by pulling a switch. After a few minutes sawdust or peat is added to create the necessary smoke and when this has been thoroughly ignited by the electrical unit, the current is switched off and the fire maintained by controlled draught. The fish are given an intensive smoking and are then cured under suction, an electric fan being used to dry them ready for packing. The unit, which is only 3 feet wide and 7 feet high, permits uniformity of curing, and fish processed by this method can be made moist or dry, dark or light according to requirements.

Inside the Civic Restaurant, Castlefield, Portsmouth.

Lighting in Civic Restaurant

Lighting fittings at the recently opened Civic Restaurant, Castlefield, Portsmouth, which were designed and supplied by the British Thomson-Houston Co., Ltd., are specially constructed to be in keeping with the architectural features of the ceiling. They take the form of a continuous translucent cornice on both sides of three ceiling coffers. Mazda 80 watt warm-white fluorescent lamps are concealed above diffusing "Perspex" screens.

Additional lighting is provided over the orchestral platform by two rows of fittings in a specially recessed and coved ceiling, so that the light sources are invisible to anyone in the restaurant. Light distribution is uniform over the whole stage. Lamps mounted above a shallow suspended glass panel are incorporated in the ceiling of the bar.

Scots Will Can Mushrooms

Plans are being prepared for the establishment of a Scottish factory for canning and processing mushrooms on a small scale. Scotland has achieved a considerable reputation for the quality of its spawn and mushrooms and a major export trade in spawn has been built up.

The factory is not expected to be in operation for some nine to twelve months.

Two Scientific Films

Two new scientific sound films, "Emulsions" and "The Story of Halibut Oil," which have been announced by Crookes Laboratories, London, may be borrowed free of charge by schools, colleges, hospitals, and scientific societies.

"Emulsions," which runs for fifteen minutes, opens with a series of simple test-tube experiments demonstrating the contrast between an emulsion and a suspension. The two types of emulsions and the function of emulsifying agents are then demonstrated, and a pictorial description is given of the preparation of emulsions experimentally and industrially by mechanical, chemical, and supersonic means and their uses in daily life.

"The Story of Halibut Oil" is a thirty-minute film divided into two parts, the first giving vivid details of life aboard a trawler in Icelandic waters, the second concerned with the scientific treatment of halibut liver, formerly a waste product, for the extraction of its vitamin-bearing oil.

The ingenious means by which the vitamin content of the oil is measured, vitamin A by spectrograph and vitamin D by biological methods, are described in detail. Refining and blending processes are shown in the closing section of the film.

Both films are available in 16 mm. and 35 mm. sizes and can be supplied at fourteen days' notice.

Appointments

Mr. T. Foggo, who gained distinction during the war years by winning the Lord Woolton trophy in the competition for the production of the best National Loaf, has been appointed manager of the new Wm. Beattie, Ltd., factory in Kirkcaldy. This plant is a modern streamlined unit designed to service the East of Scotland and reduce the volume of traffic from the West where the company's main bakeries are situated.

*

Dr. Vernon L. S. Charley, Chief Chemist of H. W. Carter and Co., Ltd., has been appointed to the board of the company as technical director.

*

At a meeting of the General Council of the British Standards Institution held on November 9, Mr. Roger Duncalfe was elected chairman in succession to the late Sir Clifford Paterson, F.R.S. Mr. John Ryan, M.C., was appointed chairman of the Finance Committee and Mr. Herbert J. Manzoni, C.B.E., was elected to succeed Mr. Sydney Tatchell, C.B.E., as chairman of the Building Divisional Council.

Pilchard Canning in Plymouth

Pilchards, which have hitherto had to be sent away for canning, may now be dealt with at a new factory erected at Plymouth capable of producing a daily output of 14,000 cans of pilchards in tomato. The plant, which occupies the entire first floor, is believed to be the first all-gas installation of its kind in the country.

Fish brought to the factory are cleaned, cut into lengths to fit the cans, and given a final cleansing in an automatic washing machine. After fifteen minutes' treatment in salting tanks they are hand-packed into cans containing tomato sauce. A conveyor belt takes the cans into an exhaust chamber for air extraction, after which they are finally sealed, and sterilised in gas-heated retorts. They are then labelled, packed, and despatched.

It is estimated the factory can be fully employed on pilchard canning for about nine months of the year; for the remaining months the concern will concentrate on bottling, pickling, and packing.

Solving the Soap Problem

A new method open to bakeries and catering establishments, as well as factories, to overcome the soap shortage is by the use of a highly concentrated liquid cleanser manufactured by the Durazone Co., Ltd. Known as "Tex Foam," this free-lathering, soapless detergent, whether used in cold, hot, hard, or soft water, is capable of removing dirt, stains or grease from hands or from any surface. It contains no ingredients that can harm skin or hair; the first few drops neutralise the lime in water and no scum is left on the sides of basins after washing. Apart from personal use, this liquid cleans plant and equipment.

Public Health Congress

Fifteen hundred delegates appointed by local authorities attended the Public Health and Municipal Engineering Congress and Exhibition, held at Olympia from November 15 to 20. Opened by the President of the Congress, Rt. Hon. Aneurin Bevan, M.P., Minister for Health, the Congress included sessions on a wide variety of subjects. Papers read covered such subjects as refuse storage and public health, rural water supplies, hospital administration, district heating, sewage sludge treatment and many others, while an all-day symposium on "The Mechanisation of Municipal and Highway Engineering Works and its Economics" was held on November 16. "Food Hygiene and the Housewife" was the subject of a conference held on November 17 which dealt with the hygienic handling of foodstuffs and gave special emphasis to the important part to be played by the housewife in furthering the cleaner food campaign. The main part of the meeting took the form of a Brains Trust, during which a team of experts supplied the answers to questions on food hygiene. Special visitors included representatives from the Ministries of Food, Education, and Health, from the British Medical Association and the Sanitary Inspectors' Association, the National Council for Hotel and Catering Education, and the Central Council for Health Education.

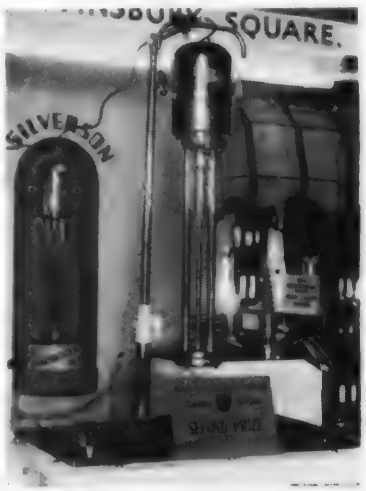
Cake and Biscuit Industries

The formation of a small Council, for the purpose of providing means of consultation with and united representations to the Ministry of Food and other Government Departments, is announced in the report of the Cake and Biscuit Manufacturers' War Time Alliance, Ltd., for the year ended June 30, 1948. The Council consists of the Food Manufacturers' Federation, the Cocoa, Chocolate, and Confectionery Alliance, and representatives of the cake and biscuit industries drawn from the Biscuit Industry Council.

The report includes an account of various negotiations with the Ministry of Food which have been carried on by the organisation during the year, an income and expenditure account and balance sheet, together with a list of members, food divisions and the respective food officers.

Multi-purpose Mixer Wins Medal

With numerous uses other than the ice cream mixing for which it was demonstrated at the recent Dairy Show at Olympia, when it won the Bronze Medal Award for New Inventions, the multi-purpose mixer/emulsifier/homogeniser marketed by Silverson Machines (Sales), Ltd., handles all kinds of ingredients with equal efficiency. The company make machines to suit every trade in which mixing is necessary and to meet both large or small requirements.



New Range of Bore Equipment

Based on the performance of larger diameter pipes, a complete range of 5/8 inch bore equipment has been made from Pyrex brand borosilicate glass for installation where severe service conditions are met. Small in diameter and of robust construction, these pipe lines, which have been produced by James A. Jobling and Co., Ltd., can be flushed with steam or detergents and will operate satisfactorily at pressures up to 50 lb. per square inch.

Transportable Dehydrating Cabinet

Fitted with special ducting and control which allow the circuit to be closed or variable at will to suit the particular medium which is being handled, the dehydrating cabinet supplied by Dehydration Equipment, Ltd., is transportable and can be used in laboratories, research departments, and other establishments where a closely controlled drying temperature is required to ensure the retention of flavour, colour, or nutritive values. Supplied in both large and small units, the cabinet incorporates an electrically driven power unit, and latest models are fitted with a specially designed Rototherm thermostatic control unit and dial thermometers in the doors to indicate any change in operating temperatures.

Ice Cream Executive Visits U.S.

Mr. Cecil W. Rodd, chairman of T. Wall and Sons, Ltd., recently returned from a two months' study of American marketing methods.

Accompanied by Mr. J. D. O. Knowles, executive director, he visited New York, San Francisco, Los Angeles, Chicago, St. Louis, and Boston, where he inspected ice cream and other factories.

From his first visit to the U.S. in 1922, Mr. Rodd brought back the idea of selling ice cream from tricycles; he has returned from his last trip with several new ideas for the manufacture and marketing of cream in this country.

Mr. Rodd has also paid a short visit to the British zone of Germany to advise on the reconstruction of the ice cream industry there.

COMPANY NEWS

The issue of 600,000 4 per cent. cumulative preference shares of £1 each and 100,000 ordinary shares of £1 each has been made by H. J. Heinz Co., Ltd.

The balance of the issued share capital amounts to £2,000,000 in ordinary shares of £1 each, which remain under the control of the Heinz family. There is no present intention of applying for a Stock Exchange quotation for either class of share.

*

The export and overseas sales of the Glaxo Laboratories group have further increased, it was disclosed by the chairman, Sir Harry Jephcott, in his report for the nine months ended June 30. Additions to manufacturing capacity were responsible for a one-third increase in turnover and have assisted in securing an export trade which is now five times that of pre-war years.

*

Increased activities during the year under review were stated by Mr. J. E. Lalor, chairman, who presided at the eighth annual general meeting of Batchelor and Co. (Ireland), Ltd., to be due to the extension of facilities for the importation of essential raw materials. Improvement in supplies permitted wider distribution of their popular lines, and a satisfactory feature of their trade during the year was the fact that it was confined almost entirely to the home market.

Owing to delays in the development of their quick freezing division it had not been possible to take full advantage of the recent heavy crop of garden peas and the available fruit supplies.

The issue of 30,000 preference shares and 200,000 ordinary shares was announced, the offer being confined to existing shareholders. Payment of the preference dividend for the year ended June 30, 1948, was approved and a dividend of 10 per cent. and bonus of 5 per cent., less tax, was declared on the ordinary shares.

*

Due mainly to exceptional difficulties arising from the change-over from war-time work to normal activities, Peerless and Ericsson sustained a substantial loss in its trading results for 1946, but progress has been well maintained and combined profits for 1947 amounted to £104,000, before taxation. A dividend of 30 per cent. on the ordinary capital recompensed stockholders for the absence of a 1946 payment, while the company has retained a useful surplus.

Production is absorbed chiefly by the bakery, confectionery, and allied trades with which the company has well-established connexions, and, given the maintenance of high output, export trade offers considerable opportunities for expansion.

OBITER DICTA

● When do mites in cheese cease to be a delectable morsel and become a pest? That depends on the palate.—*Lord Lucas of Chilworth.*

● Mr. Strachey's generous Christmas gift amounts to less than a third of a sausage per person.—*The National Federation of Meat Traders.*

● Food is the main factor in world peace. Unless science is used to help agriculture the earth will revolt against us and the problem will never be solved. —*Dr. Stross, M.P.*

● We all remember the old nursery rhyme "Dickory, dickory dock, the mouse ran up the clock." That, presumably, was not infestation. But if six mice ran up six clocks, would that be infestation?—*Lord Balfour of Inchrye.*

● We cannot make the child tolerant, self-reliant, and easy-mannered in the abstract; we have to choose some medium through which these qualities can be imparted to him. For such a purpose the meal table is ideal.—*Mr. F. Le Gros Clark.*

● Mr. —— said he felt in the same position as the other clergyman, who, in making an appeal for money, said he wanted not abstract sympathy but concrete plum pudding. The concrete plum pudding, he said, would be used for spiritual purposes.—*Letchworth Citizen.*

● Ilford Council have ruled that the proposed erection of a "stand for the sale of jellied eels" on the corner of Station Road, Ilford, would constitute "development" under the Town and Country Planning Act, 1947, and that an application for permission would be required.—*Ilford Recorder.*

● When a bicycle ride of fifty miles and upwards is undertaken the cyclist must walk up all the hills for the first hour, and postpone all heavy eating until the ride is over. A beefsteak is almost disabling. A thin slice of brown bread with currant jam and a cup of tea or a glass of shandygaff is quite enough.—*George Bernard Shaw*

Booklets Received

Designed to cut, quickly and accurately, mild steel sheet or plate up to ½ inch thick, the guillotine shears described in a recent catalogue are of strong construction and simple to operate. Manufactured by F. J. Edwards, Ltd., the shears can also handle stainless steel with the use of special blades, and, by a small adjustment to the cutting angle of the blades, plastic, rubber, fibre, and similar materials can be cut or trimmed.

*

A new coking stoker which, although not a fundamental departure from the standard machine, has considerably improved features, is described in a booklet issued by James Hodgkinson (Salford), Ltd. The stoker will deal with fuels of varying grades and sizes without loss of efficiency; it absorbs little more than 1 h.p. to drive and its cost is usually repaid in fuel saving alone in the first one to two years.

*

The incorporation of a special synthetic wax in the moulding of plastics, which is said to give anti-static properties to the surfaces of the objects made from plastics, is mentioned in a recent issue of *Packaging Abstracts.* There is also mention of a new water-soluble polyvinyl alcohol film, described as being a clear transparent film, highly resistant to fats, oils, and greases and unaffected by most organic solvents. As it is odourless, tasteless, and non-toxic it could have many uses, such as a non-removable container for materials which are to be eaten or dissolved in water.

News from Overseas

Electronic Preservation in Norway

A group of ten Bergen industrialists have recently signed a contract with a view to the exploitation in Norway of a method of preservation by electronic waves which will enable fish to be conserved in a fresh state for an almost unlimited period.

It is thought that the new process, which has not yet been commercially operated, opens up interesting prospects for the export of fresh fish from Norway. The German-American patent cuts out traditional processes involving frigorific treatment and simplifies transport of fish towards consumers' markets.

Antarctic Whaling Agreement

It is reported in Norway that Holland has now ratified the Washington Agreement concerning international limitation on the catching of whales by Antarctic pelagic expeditions. The contracting parties, other than Holland, are Great Britain, the Soviet Union, the U.S.A., and Norway.

Pelagic whaling in the Antarctic in the 1948-1949 and subsequent seasons has now been definitely fixed with a maximum quota of 16,000 blue whale units a season. Restrictions on catching may, of course, be further intensified if the control organ, which is to be established according to the Agreement, finds that further limitation is required.

Stabilising World Prices

An appeal for an international commodity arrangement as the most satisfactory method of stabilising prices on the world market was made by Viscount Bruce, chairman of the Council of the Food and Agriculture Organisation, at a conference in Washington recently. The recent wheat arrangement which had failed to come into effect was the sort of agreement he had in mind and although this particular project had received a temporary setback, he urged that the agreement and arrangements for other commodities should be considered by the conference.

South Africa's Bumper Pineapple Crop

Growers of pineapples in South Africa expect a bumper crop this year. The cultivation of pineapples is confined largely to the south-eastern sector of Cape Province in the Bathurst District, where the soil and climate are particularly suitable, and it was stated recently that there are 92 million plants in this area.

At present the total output of the growers is taken by the local canning factories. The export of fresh pineapples has not been developed hitherto, but growers would welcome such trade if it could be developed.

Canned Goods Specifications

The South African Government, through the Standards Council of the South African Bureau of Standards, has published a draft specification covering the following canned goods:

Vegetables.—Beans, beets, carrots, corn (sweet, cream-style), peas (fresh and dried), potatoes, tomatoes (whole, *purée*, and paste), and turnips.

Mixed Vegetables. — Beans in tomato sauce, carrots and peas, meat and vegetables, mixed vegetables, and pork or bacon and beans.

It is understood that if and when approved, these specifications will be made compulsory for all manufacturers.

Bananas in the Desert

UNDERGROUND STREAM PROVIDES IRRIGATION

Most of Australia's bananas are grown in the fertile coastal region of Queensland and northern New South Wales where the climate is favourable, but in the district round Carnarvon on the western coast, which has an average rainfall of only 9 in. a year, there are several thousand acres of banana plantations.

The secret of this oasis-like fertility lies in the strangeness of the Gascoyne river. At intervals of a year or two sudden rains turn the Gascoyne into a turbulent torrent, but a week later it may be dry again, remaining so until the rains return. About 20 feet below the dry bed of sand and gravel the stream maintains an unfailing supply of water, which may be supplemented by boring down to artesian water at depths of 30 feet to 40 feet.

The banana growers of Carnarvon have exploited this underground stream for irrigation purposes, each plantation having its own system. A cement cylinder 3 feet 6 in. in diameter is sunk to the water level, and as the water percolates into the cylinder it is pumped out, either into storage tanks, or directly into the small concrete irrigation channels from which it is released through furrows to the plants. The pumps are driven by 10 horse power Diesel engines and most of the irrigation units deliver from 8,000 to 10,000 gal. of water an hour.

Windbreaks of trees, vines or plantains shelter the plantations, and cover crops are grown to bind the soil, conserve moisture and increase the amount of nitrogen in the soil. Artificial fertilisers are used fairly liberally, and in other respects normal cultural methods are used. The plantations are relatively free of pests and diseases, owing partly to the isolation of the Gascoyne valley and partly to the dry climate.

Self-service installation for packaged meat at the Grand Union Super Market, Glen Rock, New Jersey.

Help Yourself Meat Market

Known as the "Meateria," the packaged meat department of the new Grand Union Super Market in Glen Rock, New Jersey, is a 100 per cent. self-service installation. New, low temperature show cases have been developed and pre-packaged meats are displayed in such a way that consumers can easily help themselves. Improved wrapping materials used prevent discoloration of prepared meats and each package is clearly marked with a thermo-plastic label identifying the product, the name of the cut of meat, the price per pound, total weight, and total cost. Pulp trays are used for bulky items such as fowl and minced meat, while cardboard backings are employed for steaks, chops, and cold meats. Meat is prepared by cutters in an air-conditioned room where temperatures range from 42° F. to 48° F.; when packaged, it is placed in specially constructed transport and conveyed to the store. Extra supplies for rush periods are stored in the bottom of the refrigerated display cases or in storage rooms.

No Night Baking in Poland

In accordance with the collective agreement for the baking industry, night work is being abolished in Polish bakeries, and over 10,000 bakers have already passed to day-shifts exclusively.

Norwegian Trade Fair

A trade fair, planned to take place in Bergen in 1950 or 1951, is to be limited to the North Sea countries and invitations will be sent to the following North Sea towns: Aberdeen, Newcastle, Reykjavik, Antwerp, Rotterdam, Gothenburg, and Aarhus. The organisers hope thereby to establish closer relations with these towns and their industries which are most intimately in touch with West Norway.

New Unilever Factories

According to Mr. Paul Rijkens, chairman of the board of directors, Unilever, Ltd., are keenly interested in the United States margarine industry and plan to build a new factory there to be completed in 1949. Mr. Rijkens also stated that it is hoped to establish a margarine and soap factory in Canada next year as well as a second triplex factory on the African Gold Coast. Now that Pakistan and India had been separated, Unilever were building their own factory in Pakistan.

To Protect Fish Supplies

Countries invited to attend a conference on north-west Atlantic fisheries to be held in Washington on January 26 include Britain, Canada, Denmark, France, Iceland, Italy, Newfoundland, Norway, Portugal, and Spain.

The conference will consider drafting a treaty to establish regulations protecting fish supplies, and to form a ten-nation council to conduct fishery conservation research in the north-west Atlantic, similar to the North Sea Council. According to the U.S. State Department, stocks of fish on the American coastal banks are becoming depleted, forcing American fishermen to extend their operations over 500 miles into the North Atlantic.

Indian Industries

GOVERNMENT'S PLAN FOR DEVELOPMENT

The Government of India has announced a three-year plan for the development of certain industries, to be achieved partly by direct State participation in industry and partly by encouraging and assisting private enterprise.

The main factors dictating the scope and pace of development will be:

(*a*) the availability of certain scarce materials and stores;

(*b*) the extent to which relations between labour and management improve;

(*c*) the extent to which private enterprise is prepared to undertake new commitments, which will depend on the extent to which the confidence of the investing public is restored;

(*d*) the extent to which the transport situation improves;

(*e*) the rate at which the hydro-electric projects materialise;

(*f*) the extent to which technicians and trained workers can be made available.

The main interest of this series to United Kingdom manufacturers will be (*a*) to help them to identify India's industrial objectives, (*b*) the implications of the industrial programme in terms of demand for raw materials, capital plant, machinery, and tools from external sources.

In the meantime United Kingdom manufacturers who would like further enquiries to be made on any specific points are invited to approach the Export Promotion Department, Board of Trade, London, S.W. 1.

Potato Research

One of the results of the programme of research into the utilisation of potatoes conducted by the U.S. Department of Agriculture has been a ten-fold increase in the production of potato flour. This is due largely to the work of department engineers in helping food processing plants and distilleries to convert their equipment to flour making. Not only is potato flour finding an expanded market for use in such items as bread, pancakes, and noodles, but it is becoming an important source of export to food-short areas.

Other projects include: obtaining industrial alcohol from potatoes; research on the use as livestock feed of potatoes not needed or desirable for human consumption; ways of improving packaging to retain quality and flavour; better methods of cooking various types of potatoes; consumer preference studies; improved storage, grading, and shipping practices, and importation of disease-resistant varieties from other parts of the world.

More Nuts from Australia?

The amount of publicity given to the groundnuts scheme of West Africa has distracted attention from certain movements by the Queensland Department of Agriculture, which is considering the possibility of cultivating a new nuts industry by commercialising the fruit of the Macadamia tree, which, during six months of each year, bears a crop of edible nuts of excellent flavour.

Hawaii has already commercialised the smooth, spherical Queensland nut by the use of special machinery to crack the exceptionally hard shell. This industry was developed in Hawaii as a result of six trees being introduced into that country from Queensland in 1892.

Mr. John Clayton, of the Queensland Department of Agriculture, has recently visited Hawaii to investigate the methods adopted for shelling and marketing these highly flavoured nuts, and it is probable that Mr. Clayton's observations will soon provide Australia with another source of trade which will prove as successful as the present walnut and peanut industries.

The Swedish Hermetet pack for biscuits, coffee, and tea.

Food Packaging Developments

Among various new packaging developments for food which have appeared in America is a tomato pack including a paper-board tray in which three or more tomatoes are placed. The tray is wrapped in colourful printed Cellophane bearing the name of the brand, through which the consumer can see the condition of the tomatoes. Transparent duplex has been used in packaging candy, the bags being crimp sealed, while in the packaging of fresh, cooked shrimp, polyethylene has been used.

A recently patented Swedish pack for various foods such as biscuits, coffee, and tea, known as the "Hermetet," may be lined with sulphite paper to make it damp-proof, or with thermoplastic coated paper so that it can be heat-sealed, the lining serving as a barrier against vapour and moisture. It can also be lined with waxed paper, aluminium foil, and different kinds of films. Various machines for filling, heat-sealing, and closing these boxes have been developed by the same company.

New American method of packing tomatoes.

Australia Plans Whaling Stations

Plans for the establishment of a series of whaling stations around the coast of the Commonwealth are enclosed in a special report submitted to the Australian Government by the Director of the Commonwealth Fishery School, Mr. Francis Anderson, and the Whaling Adviser to the Government, Captain Axel Nelson. Mr. Anderson estimates that, with modern equipment, 2,000 humpback whales could be taken each year around Australia's coastline. This catch would provide approximately 15,000 tons of whale oil and some 12,000 tons of meal and manure. In addition, with adequate refrigerating equipment, large quantities of whale meat could be provided.

Australia's annual consumption of whale oil is about 2,000 tons; the remainder of the oil would be available for export.

Sugar Refining Costs Reduced

The cost of refining sugar may be greatly reduced by a new process discovered in the U.S.A., according to a report by Dr. Donald F. Othmer, head of the department of chemical engineering in the Polytechnic Institute of Brooklyn, New York. The further advantage of saving vitamins, largely wasted by present refining methods, is also claimed for the new process. A very light yellow sugar as pure as that now sold has been manufactured on an experimental scale by the new technique, in which contaminants are washed from the raw sugar with wood alcohol. The expensive melting of the raw sugar, purification over char produced from animal bones, evaporation, recrystallisation and other steps are eliminated in this process, which will operate at a fraction of the cost of present plants.

Canned Bananas for Britain?

A Brisbane cannery is processing 8,000 dozen tins of bananas and first consignments will appear in Australian shops shortly to test public demand. If the venture is a success, canned bananas will be making an appearance in British shops.

Italian Eggs could be Cheaper

The recent congress of poultry-keepers in Copenhagen has drawn the attention of Italians to poultry keeping and its possibilities, so far as exports of eggs are concerned.

Italian eggs could easily compete on foreign markets, their size, colour of yolk, and taste being of a high standard. Should their export to this country be resumed, they could be sold at a price lower than that paid for Danish eggs.

Big S.A. Fish Cannery to Start

A large fish cannery, being set up at Laaiplek, at the Berg river mouth which, it is claimed, will be the most modern in South Africa, will be capable of producing 1,000 cases of 48 "talls" per day, and will save the labour of some 40 to 50 people in cutting and packing.

Danish-French Trade Agreement

A trade agreement which is valid for one year has been concluded between Denmark and France. Danish imports from France will include raw phosphate, potash, soda, cocoa beans, wines and spirits, chemicals, aniline dyes, iron and steel, machines, and other products. Exports from Denmark will consist of butter, condensed milk, cheese, seed, horses, fish, mussels, casein, cement, cryolite, machines, and ships.

News from the Ministries

Sugar for Ice Cream

As from November 7 the allocation of sugar to ice cream makers has been increased from 50 per cent. to 57½ per cent. of the amount used in the datum period, on condition that the recipient signs an undertaking that the fat content of his ice cream is not less than 2½ per cent.

Ice cream makers who already get an allocation of sugar will receive from their oils and fats Distribution Officer application forms for completion and return in respect of the supplementary allowance.

Raw Cocoa Prices

As the result of more favourable purchase prices for raw cocoa, the Minister of Food has made an Order, with effect from December 5, 1948, reducing the selling price of West African cocoa in the United Kingdom from 225s. 6d. to 190s. 4d. per cwt. ex store (exclusive of duty).

This reduction in the cost of raw cocoa will be reflected in lower retail prices for chocolate and chocolate confectionery, which are now under negotiation with the industry.

Oils and Fats

No change will be made in the prices of refined oils and imported edible animal fats allocated to primary wholesalers and large trade users during the eight week period ending January 29, 1949.

Threshed Home-grown Peas

There will be no change in prices for threshed home-grown peas of the 1949 crop. The standard price of 51s. per cwt. for threshed peas containing 15 per cent. of waste will be the same as for 1948; the scale of the additions or deductions to be made according to the percentage of waste below or above the standard will also be the same.

The Ministry of Food has again undertaken to purchase between January 1, 1950, and June 30, 1950, at the appropriate specified price to the grower, all threshed home-grown peas of the 1949 crop which are in dry and good merchantable condition, and for which the grower or contractor cannot find a buyer.

This undertaking applies to threshed home-grown peas of the following varieties: Harrison's Glory, Dutch Marrowfats, Lincoln Blues, and small Dutch Blues. Intending growers of threshed home-grown peas are advised where possible to make contracts for the 1949 crop.

Manufacture of Feedingstuffs

The chief changes brought about by an Order amending the Feedingstuffs (Regulation of Manufacture) Order, 1948, are as follows:

(1) The maximum authorised percentage of wheat by-products is reduced from 30 per cent. to 25 per cent. in National Cattle Foods and from 35 per cent. to 30 per cent. in National Pig Foods and National Poultry Foods. This change is in accordance with the supply position of wheat by-products and of other cereal feedingstuffs.

(2) Dried whey powder is authorised as an ingredient of National Baby Chick Food. This enables dried whey powder to be used instead of dried milk powder, which is at present scarce.

(3) Riboflavin is authorised as an ingredient of compounds and concentrates. This change results from technical developments in the production of riboflavin, which is a form of vitamin B_2.

The new Order came into operation on November 8, 1948.

Imports from Italy

Following the recent arrangements for the importation of certain fresh fruit and vegetable produce, the Ministry of Food announces, in agreement with the Board of Trade, that as from midnight on November 11/12, 1948, no further imports of aubergines, grapes, melons, pears, and fresh pimentoes from Italy are being permitted under the Open Individual Licences issued by the Board of Trade.

Any consignments which can be shown to the satisfaction of the Commissioners of Customs and Excise to have been in transit before midnight on November 11/12, 1948, will be admitted.

Fresh Fruit and Vegetables

The following additions have been made to the list of items which may be imported under the open individual licensing arrangements previously announced.

The commodities and the countries concerned are:

Lemons—Greece.
Mushrooms; onions—Hungary.
Tomatoes—Spain.
Fresh truffles—France and French North Africa.

The period during which imports of tomatoes are normally permitted is from November 1 to April 30. It must be understood by all importers, however, that under the open licensing arrangements it may be necessary to stop the import of any commodity at any time.

Importers who already hold the appropriate open licences (prefix No. O.F.F.V.) will be allowed, without amendment to their existing licences, to import the commodities mentioned above and those mentioned previously from the countries named against each commodity.

Applications by importers not already in possession of such open licences should be submitted to the Ministry of Food, Fresh Fruit and Vegetable Division, Import Section, Carlton Hotel, Pall Mall, London, S.W. 1.

Importers are also reminded that imports of green beans, green peas, and turnips (new early) from the countries specified by the Ministry of Food early in 1948 are permitted as from November 1, 1948.

Feedingstuff Prices

The Feedingstuffs (Maximum Prices) Order, 1948, has been amended to make the following changes:

1. Distributing dealers' and retailers' margins on sales of animal feedingstuffs, whether in straight form or as compounds or mixtures, are increased, and there is a corresponding increase in the basic prices of feedingstuffs. These increases in price are mainly of the order of 2s. 6d. per ton, and have been authorised to cover the increase in traders' costs over recent years. The price of National Poultry Balancer meal bought in small lots by domestic poultry keepers remains unchanged.

2. The permitted charge for handling feedingstuffs in and out of store is increased from 4s. per ton to 5s. 3d. per ton.

3. Dried yeast as a feedingstuff is removed from price control. This has been done in order to provide an adequate incentive for the drying of yeast for this purpose.

Full details of these changes are set out in the amending Order which came into force on November 15.

Export Quotas

From time to time the Board of Trade are asked by exporting firms whether goods may be delivered from the export quota to residents of the United Kingdom against payment from accounts in other parts of the sterling area. The Board of Trade wish to make it clear that such transactions are directly contrary to the national interest. They should not appear as exports in the returns made by industry to the Board, neither should they be recorded against export targets.

In special cases, where certain items are sold under diplomatic privilege or to an overseas visitor against genuine payment in the purchaser's own currency, it is apparent that the sale can earn foreign currency as well as if the goods were in fact exported. In other cases it seems that goods are finding their way to United Kingdom residents who are merely using banks in other parts of the Commonwealth as their channel of payment in order to fulfil the letter of the undertaking about export quotas. At a time when scarce raw materials, such as steel, are vitally needed for export production, it is clear that the whole aim of the export drive is being defeated if goods produced with raw materials allocated for export are allowed to find their way on to the home market by devices of this kind.

Employment of Managerial Staff

Following an undertaking given by the Parliamentary Secretary to the Ministry of Food in the House of Commons recently, it has been decided to delete from the relevant Orders the provision which prohibits certain traders from employing in a managerial capacity a person who was in control of any premises at the time when they were closed by the Police under Defence Regulation 42c. It is considered that this provision is no longer necessary to safeguard the equitable distribution of rationed and controlled foods.

The necessary amendments have already been made to the Food (Licensing of Retailers) Order, 1948, the Food (Licensing of Establishments) Order, 1948, and the Food Rationing (General Provisions) Order, 1948, Amendment No. 3 Order, 1948. Similar amendments are being made to the Bread (Control and Maximum Prices) Order, 1947, the Flour Confectionery (Control and Maximum Prices) Order, 1946, the Biscuits (Licensing and Control) Order, 1943, and Chocolate, Sugar Confectionery and Cocoa Products (Control and Maximum Prices) Order, 1944.

Edible Gelatine

The Edible Gelatine Order, 1948, which came into force on November 22, replaces the Edible Gelatine (Control) Order, 1947, as amended.

As the supply position of edible gelatine has improved, the new Order permits edible gelatine to be used in all types of food manufacture. Previously its use was limited to certain specified foods. The use of gelatine other than edible gelatine as defined in the Order continues to be prohibited in the manufacture of food.

Licences are still required for the manufacture of food products containing gelatine and also for the prepacking of edible gelatine.

Food Standards and Hygiene

MINISTRY OF FOOD'S RESPONSIBILITIES

In consequence of the coming into force of the Transfer of Functions (Food and Drugs) Order, 1948, the Ministry of Food is now the central department concerned with the composition, description, and inspection of food, and with hygienic conditions in the food trades. Notification of this change was given to Local Authorities by the Ministry of Health and attention was also drawn to the retention of certain functions by the Ministry of Health and by the Ministry of Agriculture and Fisheries. The Order made no change in the responsibility of local authorities for the execution and enforcement of the legislation.

The Ministry of Food's responsibilities under the new arrangements will be discharged by three Divisions:

The Food Standards and Labelling Division (under Mr. C. A. Adams, C.B.E., B.Sc., F.R.I.C.) is responsible for the promotion of food standards and exercises the central department's functions in relation to those sections of the Food and Drugs Act dealing with the composition and description of food, the Defence (Sale of Food) Regulations and the Labelling of Food Order. It handles all technical correspondence with chemists.

The Food Hygiene Division (under Mr. N. R. C. Dockery) is responsible for the promotion of measures to improve hygienic conditions in the food trades and exercises the central department's functions in relation to those sections of the Food and Drugs Act dealing with food inspection and hygiene.

The Liaison Division (*Food Standards and Food Hygiene*) (under Mr. R. Wentworth) provides, for the two Divisions above, a liaison with the local authorities and with the public (other than manufacturers and traders). It deals with all enquiries from local authorities regarding the day-to-day administration of the above legislation, including applications for the Minister's consent to prosecutions, Public Analysts' appointments and Reports, and applications under Sections 15 and 16 of the Food and Drugs Act, 1938. It is also responsible for liaison with the local authority associations and professional bodies.

The address of all three Divisions is 47, Portman Square, London, W. 1. Telephone: Welbeck 5500.

Frustrated Exports

The Board of Trade's attention has been drawn to the fact that some wholesalers who are entitled to take the higher wholesale margins on their normal home trade are of the opinion that they may take these margins on sales of goods bought by them for export and now released for the home market as frustrated exports. In the Board's view merchants making such sales are exporters within the meaning of the Miscellaneous Goods (Frustrated Exports) (Maximum Prices) Order, 1948, S.I. 1948 No. 2312. Their price for the sale of these goods will therefore be controlled by Article 3 of that Order and must in no case exceed the price paid by them, plus the amounts paid for storage, carriage, and insurance, plus 5 per cent. on the total thereof.

Imports of Lemons

Following the recent statement that the responsibility for the importation of lemons was to be returned to the private trade, the Minister of Food, in agreement with the President of the Board of Trade, has announced that lemons have been added to the list of items which may be imported under the open individual licensing arrangements previously announced.

The countries from which lemons may be imported under these arrangements are British West Indies, Cyprus, French North Africa, Italy, and Tripolitania.

Importers who already hold the appropriate open licences (prefix Nos. O.S.F. for Italy and O.F.F.V. for the other countries) will be allowed, without amendment to their existing licences, to import both these commodities and those previously mentioned from the countries named against each commodity.

Applications by importers not already in possession of such open licences should be submitted to the Ministry of Food, Fresh Fruit and Vegetables Division, Import Section, Carlton Hotel, Pall Mall, London, S.W. 1.

Consideration will also be given to applications for licences to import lemons from sources other than those mentioned above. Any such applications should be submitted on Form ILD/A, which may be obtained from the Board of Trade, Import Licensing Department, 189, Regent Street, London, W. 1, from the usual Customs Offices, or from the Ministry, and should be sent in the first instance to the Ministry of Food at the address given in the foregoing paragraph.

South African Imports

The mission sent by the Minister of Food to discuss the programme of food imports from South Africa for 1949 has now successfully concluded its negotiations. The new programme is substantially the same as for 1948, with such variations as have appeared necessary in the light of trade experience during 1948.

In order to give effect to the new maximum prices for peaches, nectarines, plums, apricots, and grapes agreed during these negotiations, an Order has been made amending the Imported Deciduous Fruit Order, 1947. As last year, the wholesale and retail prices will be controlled; the maximum prices of plums and grapes will, however, be lower. The fruits will be imported under licence by the South African Deciduous Fruit Board and distributed by their own panel of salesmen to wholesalers and retailers as before.

The Order provides for the introduction of two types of standard packages for peaches and nectarines, both less in weight than the standard package used in 1947, while that for apricots is also less in weight. The maximum wholesale prices per package have been adjusted accordingly. The maximum retail prices for peaches, nectarines, and apricots remain unchanged.

Information and Advice

Mould Control in Bakeries

B.2950. *We shall be glad if you can indicate any measures of control which may be adopted in bakeries and other food factories against airborne spores.* (Sussex.)

Mould is always difficult to control in bakehouses, where the necessary warmth and humidity favour growth. If the relative humidity of the atmosphere in a food-preparing factory can be kept below 85 per cent., mould growth will be retarded. Above 85 per cent. growth is exceedingly rapid at high, though not so rapid at low, temperatures.

Preventive measures lie principally in the direction of absolute cleanliness. The whole place should be kept as free as possible from dust and deposits of any kind. This, of course, is more difficult in a factory handling flour.

In the United States of America attempts have been made by the manufacturers of commercial equipment to control airborne spores with ultra-violet irradiation. Ultra-violet seems to be fairly successful at preventing mould and bacterial growth under controlled conditions, for example, in hospitals, but this is not yet proving so successful in commercial premises. The potential risk to operatives is also a serious factor.

An article called "The Control of Fungi in Bakery Plants" (R. Nagy, *Bakers' Digest*, 1948, **22**, 47 to 48 and 51) may be of interest. In a recent issue of the *Journal of the American Medical Association* (1948, **137**, 1600 to 1603) a warning note was sounded by the United States Council on physical medicine. They stated that, although mould spores are difficult to kill by ultra-violet rays, there does seem to be a reduction in mould growth from "direct hits" on directly irradiated surfaces, *e.g.* walls of bakeries. The dangers from burns and eye damage are stressed.

Probably the best control measures at present practicable, apart from general cleanliness, lie in using a hard glossy paint for the walls, such as a good quality oleo-resinous varnish based on an alkyl or phenol-formaldehyde resin. Zinc oxide is probably toxic to moulds and is usually recommended for incorporation in surfaces liable to contamination. The walls should also be washed down every few weeks with clean water or a solution containing a fungicide.

There are also various fungicides that can be added to paint before it is applied to walls, such as I.C.I.'s "Shirlan" (salicyl anilide), but all these may modify the properties of the paint and should not be incorporated before consulting a reputable paint manufacturer.

Information Supplied

B.2971. *Uses for lactose and lecithin.* (Lancs.)

B.2979. *Literature on pre-cooked frozen foods.* (London.)

B.2984. *Manufacturers of mustard in bulk.* (Eire.)

B.2985. *Suppliers of equipment for candy and sweet-making, and literature on the subject.* (Hong Kong.)

B.2986. *Manufacturers of a centrifugal machine for pulping and crushing citrus peel for the extraction of essential oil.* (London.)

B.2987. *Names of firms supplying steam equipment for factory cleaning.* (Scotland.)

B.2988. *Suppliers of a pudding steamer operating off a steam boiler.* (Southern Rhodesia.)

B.2991. *Suppliers of gummed paper in rolls.* (Lancs.)

B.2992. *Suppliers of unrationed edible oils.* (London.)

B.2993. *Names and addresses of manufacturers of bottle capping machines.* (Glam.)

B.2994. *Manufacturers of plant for decanting olive oil.* (Sussex.)

B.2995. *Suppliers of tin shapes suitable for small fancy cakes.* (Eire.)

B.3001. *Manufacturers of automatic weighing machinery.* (Lincs.)

B.3002. *Suppliers of new or second-hand machinery for the manufacture and wrapping of choc-ices.* (Devon.)

B.3006. *Suppliers of plant for ice cream manufacture.* (Durham.)

B.3014. *Manufacturers of a machine suitable for making fruit purée.* (Lancs.)

B.3015. *Suppliers of machinery for gutting and boning herrings.* (London.)

B.3026. *Manufacturers of portable refrigerators.* (India.)

B.3030. *Suppliers of a flour sack elevator.* (Eire.)

B.3031. *Manufacturers of collapsible tubes.* (South Africa.)

B.3033. *Names and addresses of potato crisp machinery manufacturers.* (Ceylon.)

B.3034. *Suppliers of filling and canning machinery.* (Australia.)

B.3035. *Manufacturers of steaming cabinets.* (Eire.)

B.3038. *Manufacturers of an electric drink mixer.* (South Africa.)

B.3039. *Suppliers of apple peeling machinery.* (Surrey.)

B.3040. *Firms supplying machinery for the packing of butter and margarine.* (London.)

B.3041. *Suppliers of cooking equipment for making large quantities of soup.* (Scotland.)

B.3042. *Manufacturers of can openers.* (Glam.)

B.3043. *Suppliers of macaroni cut into fancy shapes.* (Lancs.)

B.3044. *Manufacturers of dough mixing machinery and suppliers of synthetic cream.* (Yorks.)

B.3045. *Suppliers of monosodium glutamate.* (Leics.)

B.3046. *Literature on fruit juices.* (Herts.)

B.3047. *Suppliers of jacketed steam pans.* (Middx.)

B.3048. *Suppliers of label perforating machinery.* (Devon.)

Information Required

B.2996. *Supplies of "Celite," a medium for filtering lime juice and wines, etc.* (Kenya Colony.)

B.3027. *Manufacturers of the "Rowan" bowl cutter used for cutting and mincing of meat for the manufacture of sausages.* (London.)

Recent Patents

These particulars of new patents of interest to readers have been selected from the "Official Journal of Patents," and are published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

Specifications Published

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 1s. each.

606,612. DEWEY AND ALMY CHEMICAL CO.: Side seam lining compound for cans.

606,704. TOLEDO SCALE CO.: Meat chopping machines.

606,776. BAKER PERKINS, LTD., and PALMER, A. R.: Dough dividers.

606,882. STANDARD TELEPHONES AND CABLES, LTD.: Method of dehydrating vegetable food products.

606,908. NAAMLOOZE VENNOOTSCHAP OCTROOIEN MAATSCHAPPIJ ACTIVIT.: Process for the separation of sugar from molasses.

607,070. HALES, HANCOCK AND GODWIN, LTD., and HEAL, L. C.: Mincing, grinding and like machines.

607,124. GLUCOSERIES REUNIES SOC. ANON.: Process for the manufacture of crystallised glucose of very high purity.

607,139. PATON, CALVERT AND CO., LTD., and PATON, W.: Closures for canisters and the like containers.

607,343. DEWSBURY, A. (trading as AUTO-LEC ENGINEERING CO.): Vegetable peeling machines.

Abstract of a Recent Specification

Coffee Substitute from Cereal Bran

This invention relates to a process for the manufacture of a coffee substitute from cereal bran or a mixture of such bran and coffee.

Processes for the manufacture of coffee substitutes are already known in which a cereal bran is roasted. In these known processes, however, the fine flakes of bran frequently become carbonised through prolonged contact with the walls of the roasting chamber. This is a serious disadvantage since the carbonisation of the bran particles imparts a disagreeable taste to the resulting beverage.

One of the objects of the invention is to overcome this disadvantage.

In this process the bran or mixture is roasted in a closed roaster from which air is excluded, the mass under treatment being constantly agitated during the roasting and also being displaced continuously from the inlet towards the outlet of the roaster.

In a preferred form of the invention the coffee substitute is manufactured from wheat bran which is impregnated with the flavour of natural coffee.

The roasting of the bran can be carried out by maintaining a steam atmosphere in the roaster, the steam escaping from the bran, and forming 20 per cent. of the composition of the bran, being retained in the roaster and utilised for this purpose.

The bran may be cooled after roasting, the mass being otherwise maintained in an unchanged condition and, more particularly, the coloration obtained by the roasting operation being retained.

This cooling, which can be performed in a vessel arranged immediately by the side of the roaster, not only permits of stabilising the colour of the roasted bran, but also avoids any danger of inflammation through contact of the roasted bran with the air.

A mixture of bran and natural coffee can also be roasted and ground together if desired. The aroma escaping from the coffee is absorbed by the bran, which forms an inert absorbent mass. Thus, the fragrant volatile elements of the coffee are retained and the flavour of the prepared infusions is greatly improved.

605,714. *Les Gourmets, S.A.*

Trade Marks

The list of trade marks of interest to readers has been selected from the "Official Trade Marks Journal" and is published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

PROTOLYSATE.—647,349. Pharmaceutical preparations, infants' and invalids' foods and dietetic foods, all being enzymic hydrolysates of protein. **Mead Johnson and Company** (a Corporation organised under the laws of the State of Indiana, United States of America), Ohio Street and St. Joseph Avenue, Evansville, State of Indiana, United States of America; Manufacturers.

VITREX.—650,412. Infants' and invalids' foods and pharmaceutical foods. **George King and Company, Ltd.**, Albion Food Mills, Kingsbury Road, London, N.W.9; Manufacturers.

CHOCARRÉ.—654,679. Cocoa, non-medicated confectionery, ices, honey, and treacle. **N.V. Cacao-En Chocolade-Fabriek "Union"** (a Corporation organised and existing under the laws of the Kingdom of the Netherlands), Paul Krugerkade, No. 45, Haarlem, Holland; Manufacturers and Merchants.

COASTAL.—659,153. Canned fish, and foods for human consumption prepared from fish. **Macpherson, Train and Company, Ltd.**, Adelaide House, London Bridge, London, E.C.4; Produce Importers.

LAUREL-CHOC.—659,432. Chocolate flavoured preparations for coating cakes and confectionery and being for use in the bakery and confectionery trades. **Lawrence and Hilton, Ltd.**, 481, Waterloo Road, Blackpool, Lancs; Manufacturers.

CREAMOLA.—661,523. Farinaceous foods, custard powder, jelly powder (for food), blancmange powder, baking powder, golden raising powder, cornflour (for food), preparations for making gravy, cake flour, jelly crystals, custard pudding preparations, powdered eggs, and pudding powders. **Creamola Food Products, Ltd.**, 114, Cornwell Street, Glasgow, S.1; Manufacturers.

AROBON.—661,640. Pharmaceutical preparations, dietetic foods, and infants' and invalids' foods. **Nestlé's Milk Products, Ltd.**, 6 and 8, Eastcheap, London, E.C.3; Manufacturers.

VISCOUNT.—662,138. Biscuits (other than biscuits for animals). **Burton's Gold Medal Biscuits, Ltd.**, Quality House, Vicarage Road, Blackpool; Manufacturers.

New Companies

Kenpat Crisps, Limited. (459565.) 13, High Street, Sheerness, Kent. To carry on business of manufacturers of and dealers in potato crisps, etc. Nom. cap.: £4,000 in £1 shares. Permt. dirs.: K. G. Muir, 58, St. Helens Road, Sheerness; P. W. O'Callaghan, 92, Unity Street, Sheerness.

Pluscold Installations, Limited. (459665.) 27, Castle Drive, Ilford. To carry on business of refrigeration and cold storage engineers, etc. Nom. cap.: £2,000 in £1 shares. Dirs.: F. A. James, 27, Castle Drive, Ilford; L. E. Stevens, 36, Merton Mansions, Bushey Road, Raynes Park, S.W.20.

R. H. Knight (Cowfold), Limited. (459713.) Liverpool Chambers, Liverpool Gardens, Worthing. To carry on business of bakers, pastrycooks, biscuit makers, etc. Nom. cap.: £1,500 in £1 shares. Dirs.: R. H. Knight and Mrs. A. G. Knight, 19-21, Broadwater Street, East Worthing.

Sabrina, Limited. (459714.) 17, Severn Side South, Bewdley. To carry on business of manufacturers of and dealers in mineral and aerated waters, syrups, cider, perry, wines, beers, and spirits; ice cream manufacturers and dealers, etc. Nom. cap.: £7,500 in £1 shares. Dirs.: F. Coates, 378, Chester Road North, Kidderminster; B. Coates and Mrs. I. Coates, 17, Severn Side South, Bewdley.

Taken from the Daily Register, compiled by Jordan and Sons, Limited, Company Registration Agents, 116, Chancery Lane, London, W.C. 2.

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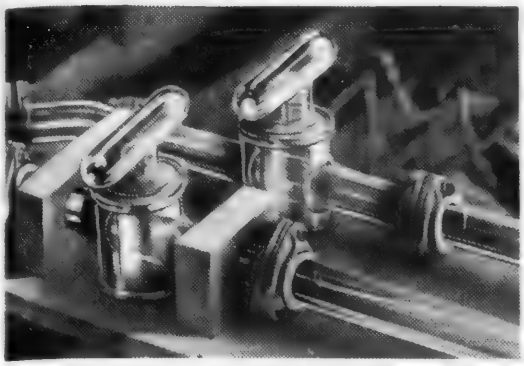

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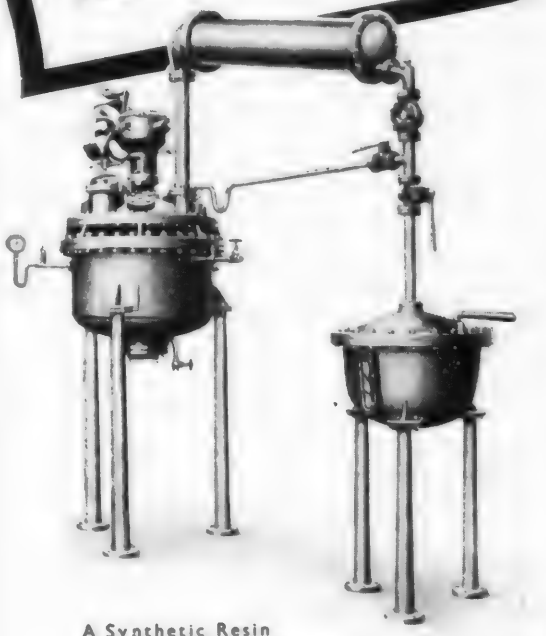

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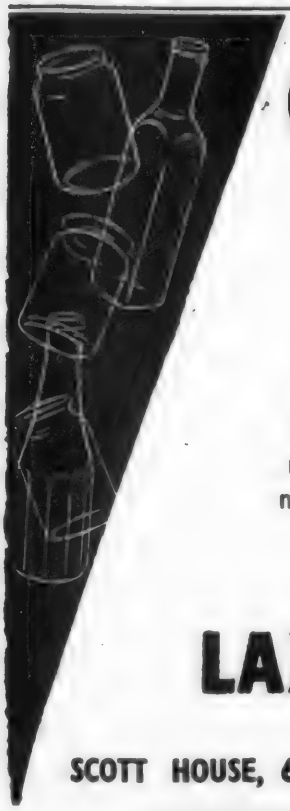

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The EJECTOPUMP (Compressed Air Operated)

pumps these fruits — without Crushing or Aeration!

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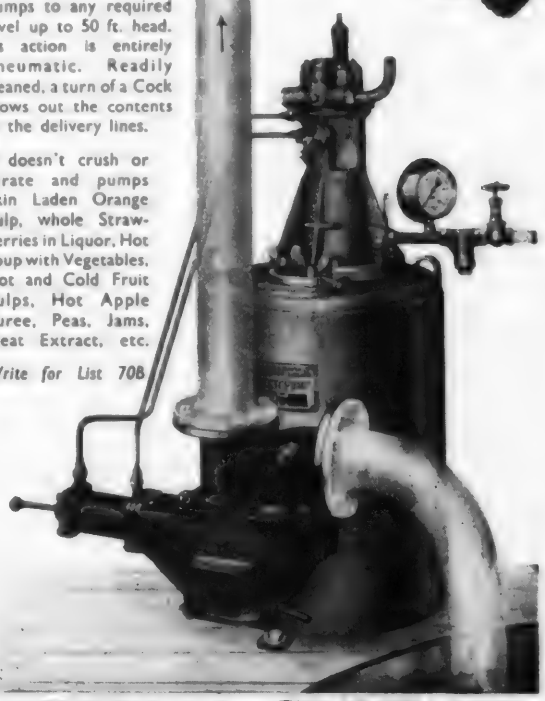

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"*Dost thou rise at seven in the morning, dost thou bend thy mind attentively to business, dost thou cheerfully ask leave for every absence and give a faithful account of thy time?*"

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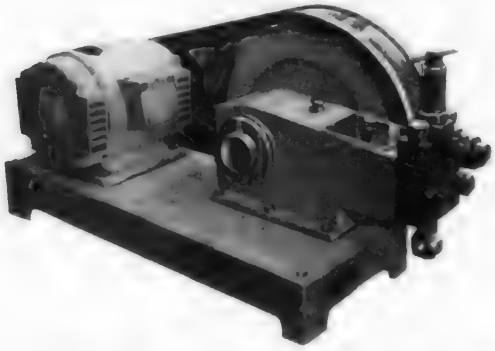

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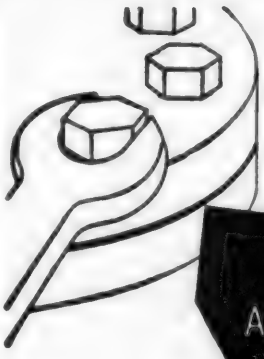

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will make and keep tight every joint in your works—from the simplest to the most difficult, both flange and screwed pipe.

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T 86

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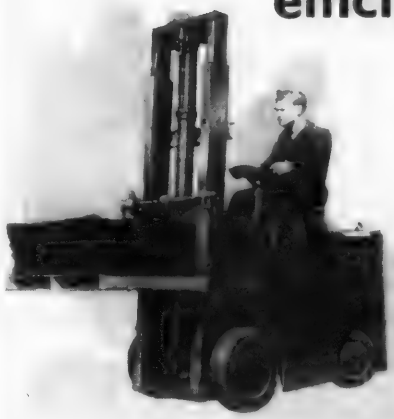

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Capacity—1 ton with load centres at 1 ft. 6 ins. from heel of forks.
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Minimum overall height—7 ft. 4½ ins.
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Speed of lift—22 ft. per minute with 1 ton load.

Can also be supplied with 8 ft. maximum lift, minimum overall height of 6 ft. 4½ ins.

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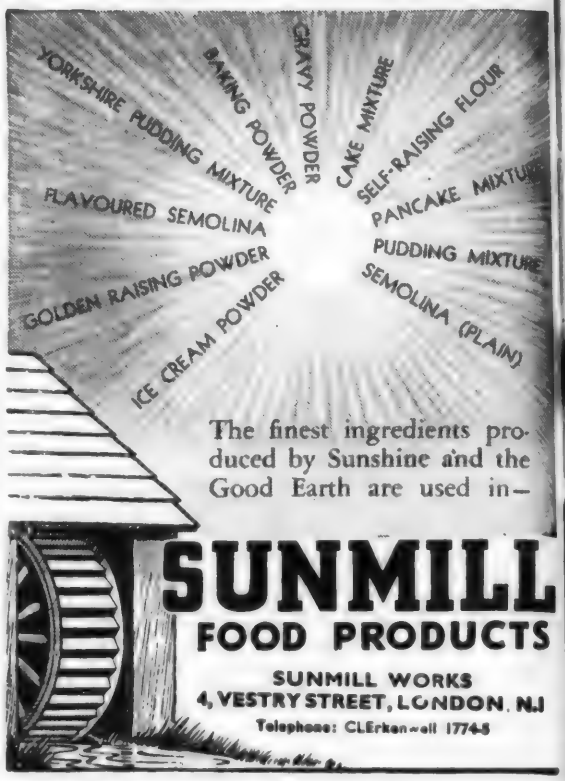

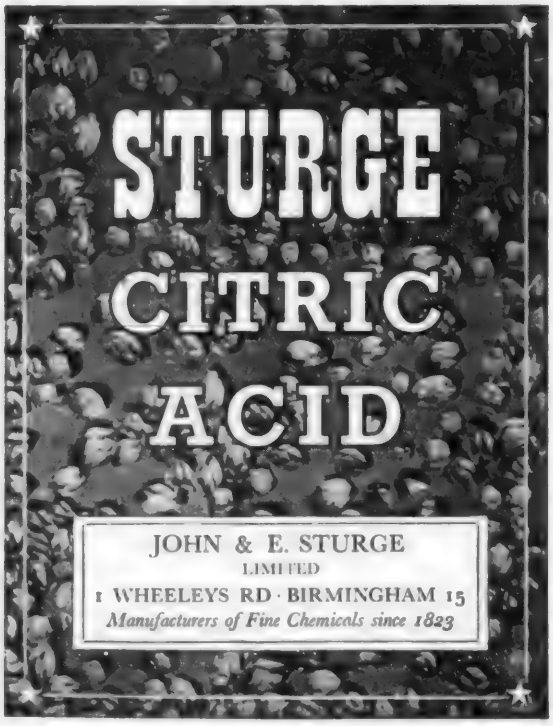

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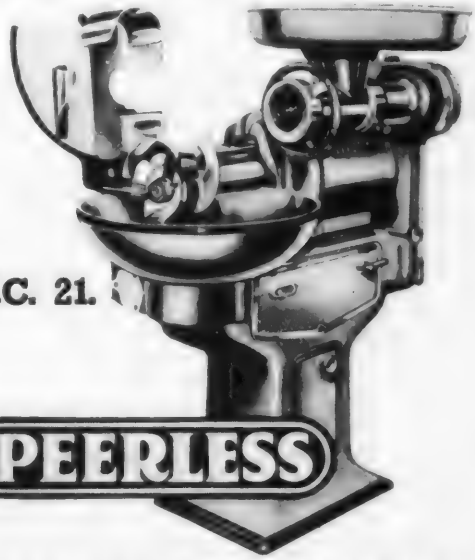

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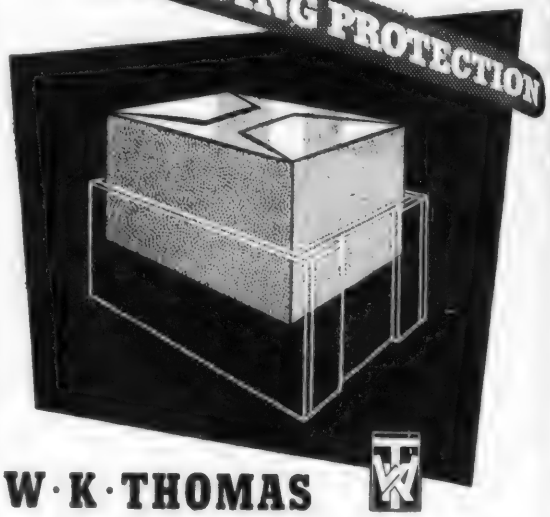

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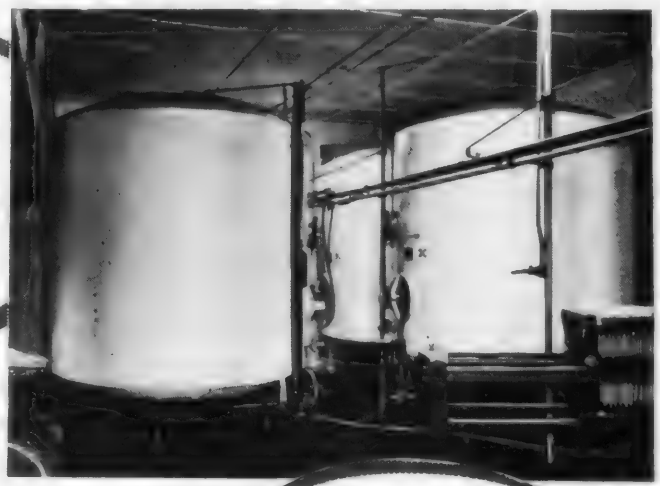

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Stainless steel Mixing Pan, 3' 8" inside diameter tapering to 2' 7" diameter, 3' 10" deep.

60-barrel stainless steel Tanks containing filtered and polished beer.

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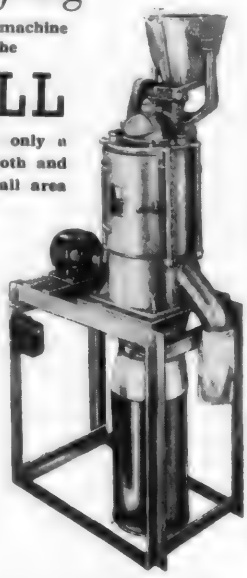

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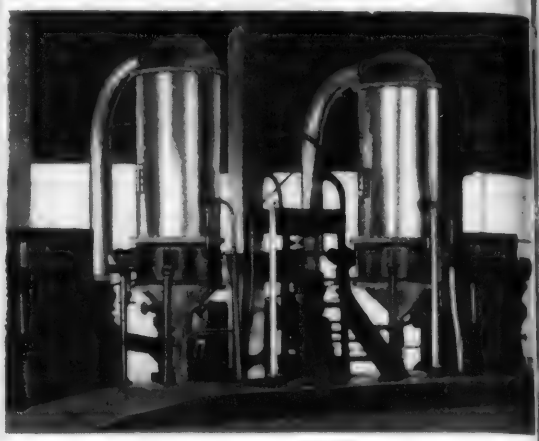

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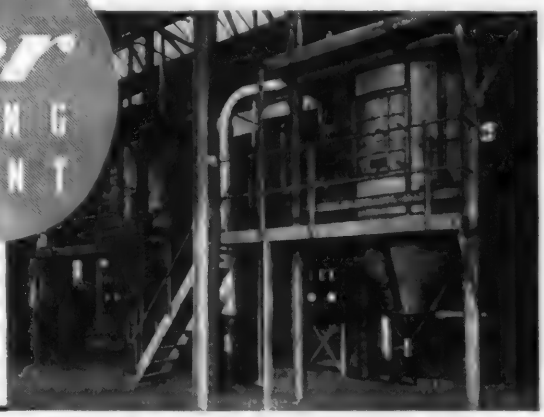

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6	950	400	S.C., T.E.	R. 319	20	720	400 440	S.C., S.P.	Alt. 331
6	1430	400 440	S.C., S.P.	WB. 180	20	575	400	S.R., S.P.	R. 318
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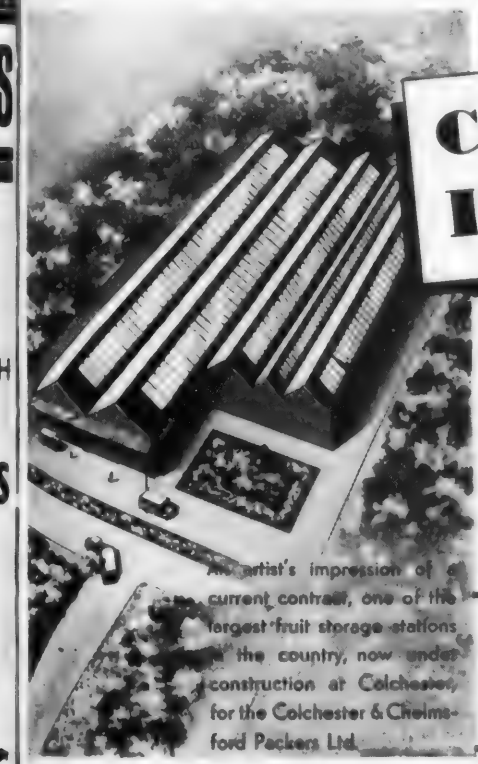

An artist's impression of the current contract, one of the largest fruit storage stations in the country, now under construction at Colchester, for the Colchester & Chelmsford Packers Ltd.

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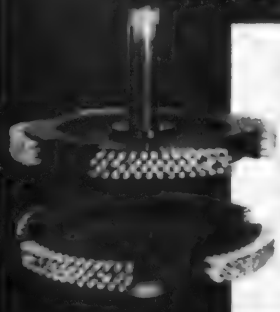

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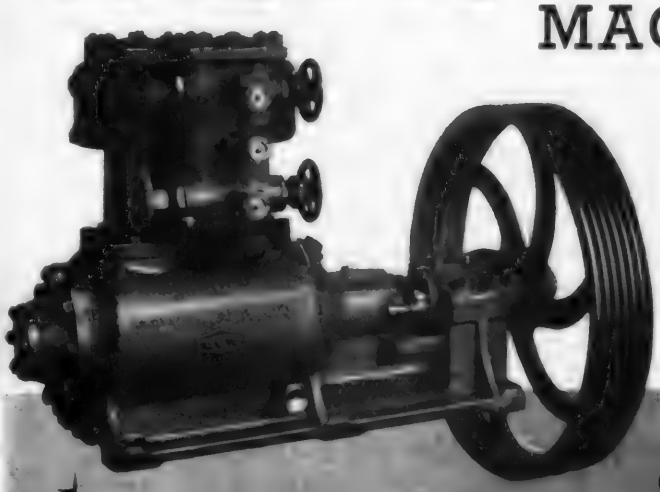

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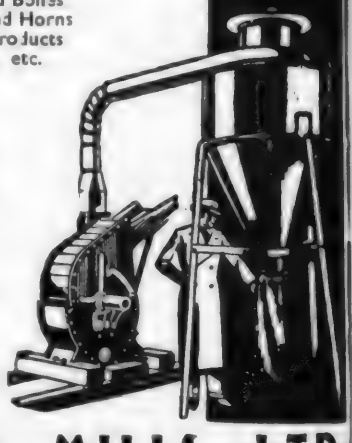

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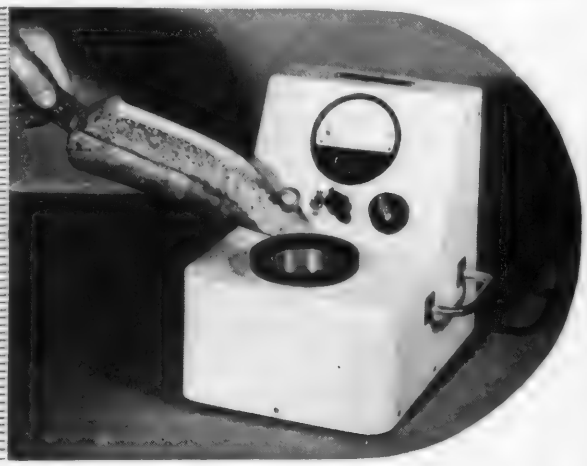

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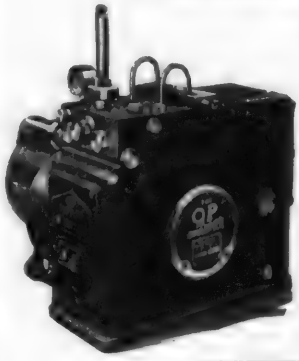

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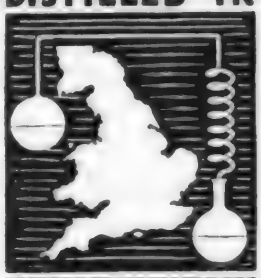

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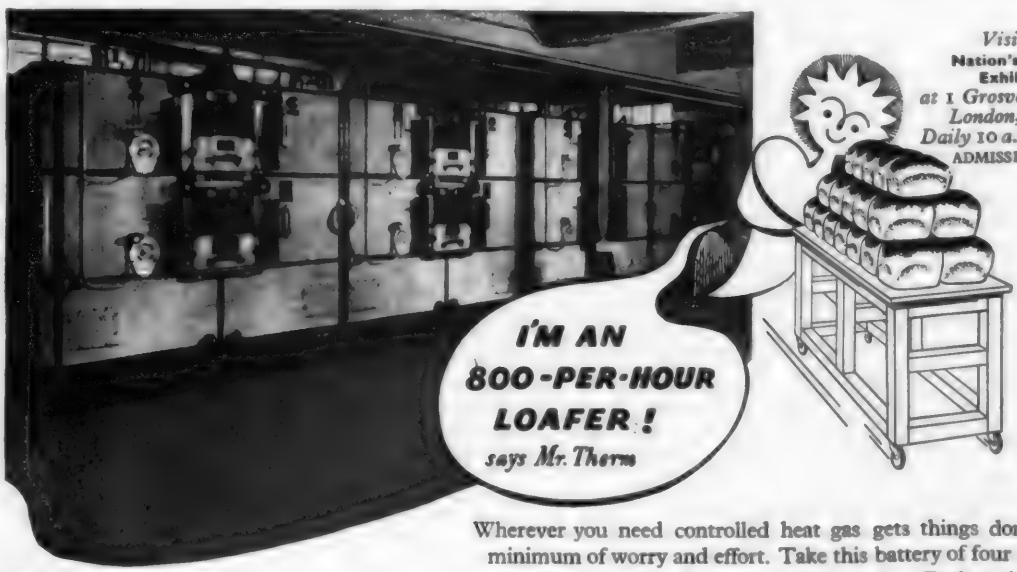

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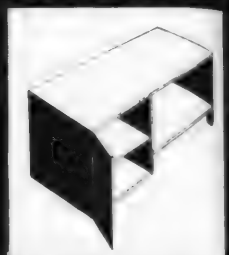

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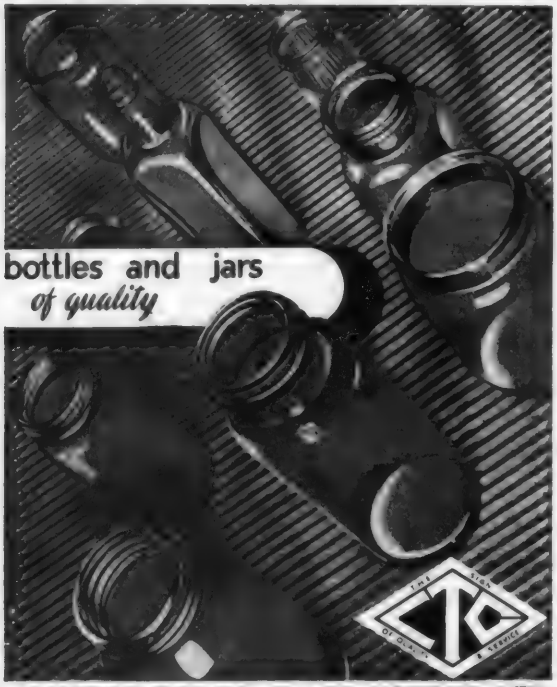

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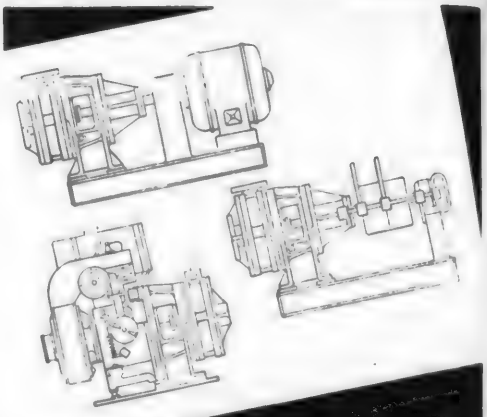

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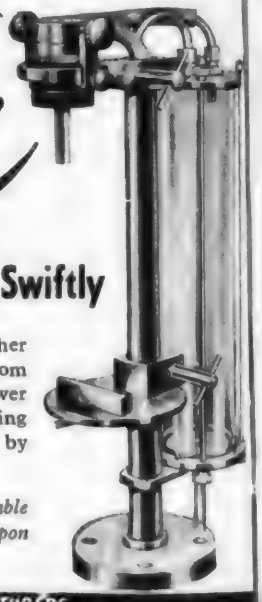

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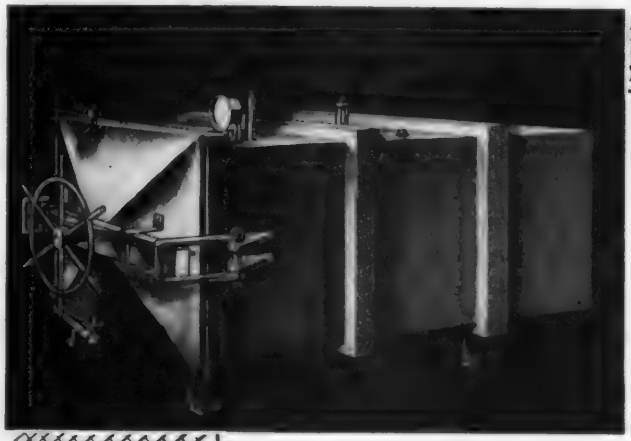

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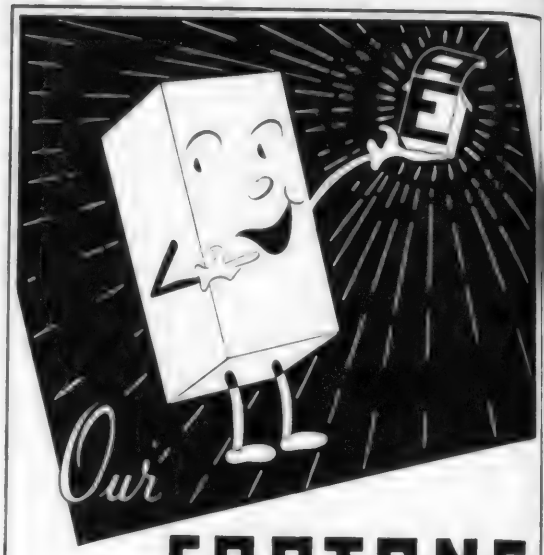

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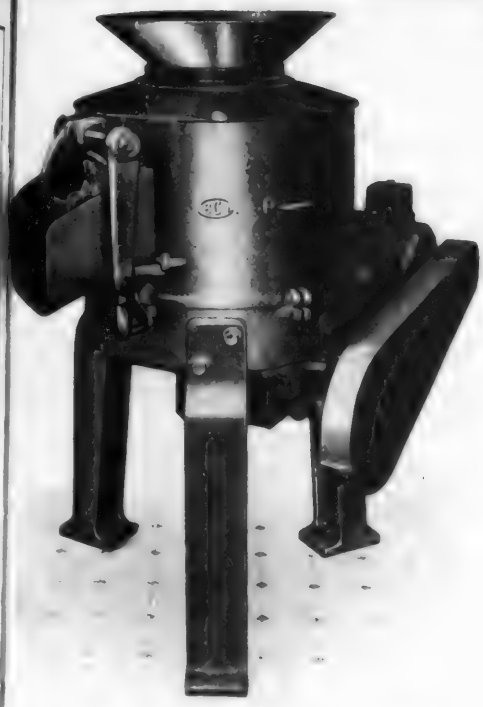

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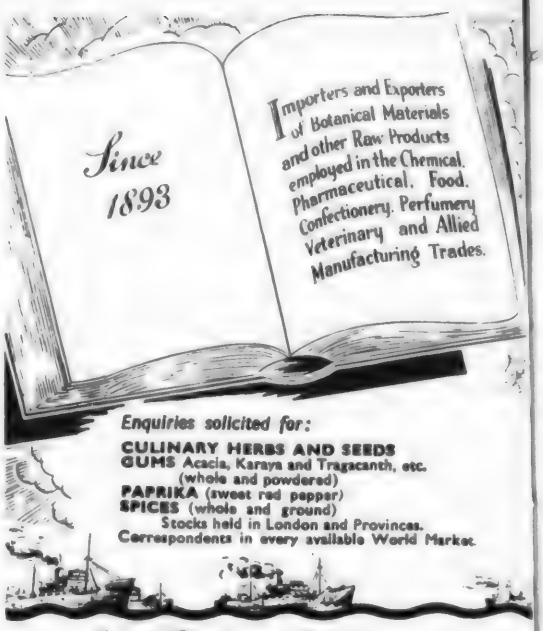
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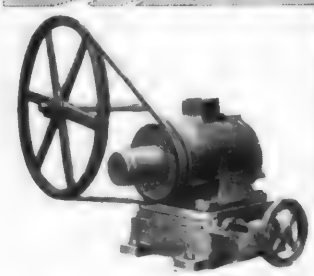

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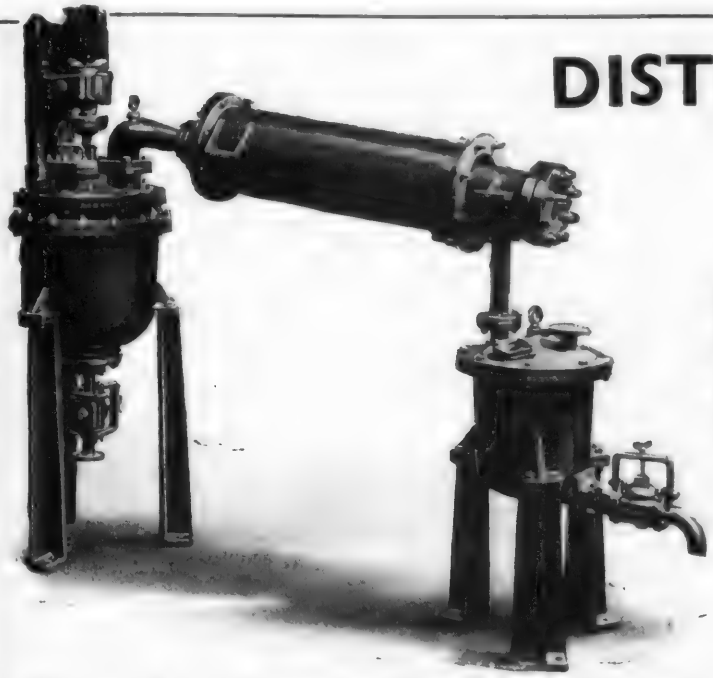

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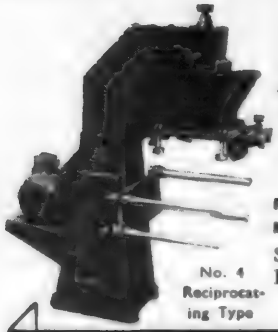

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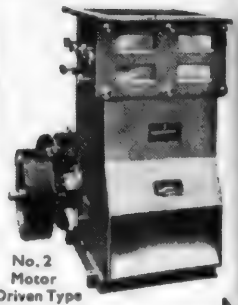

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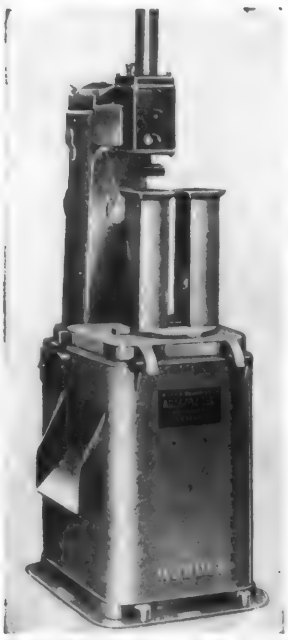

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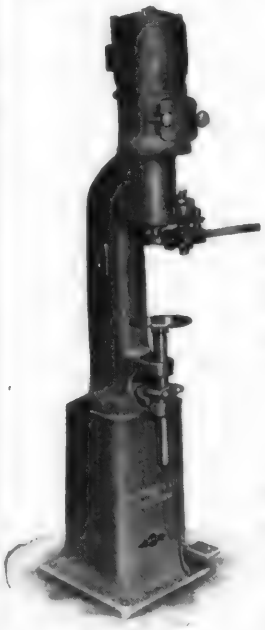

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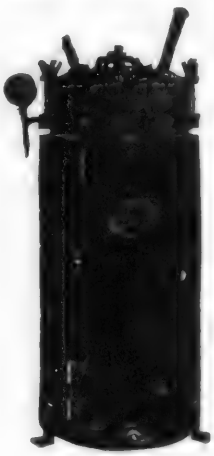

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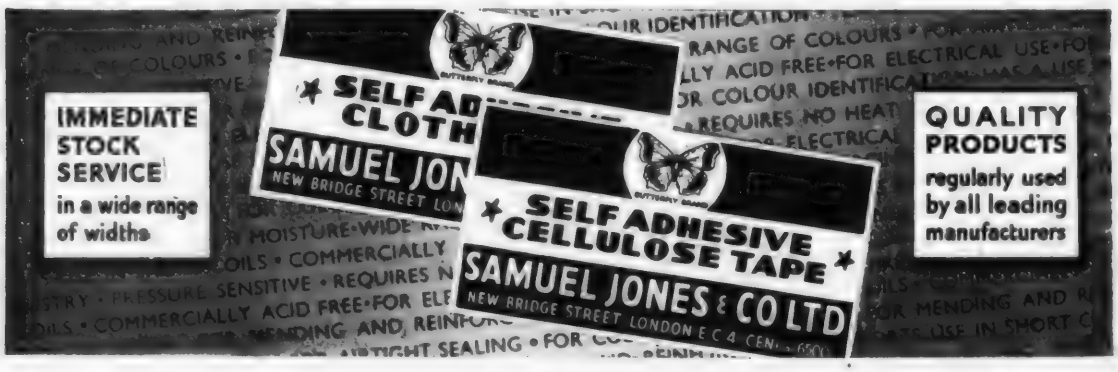
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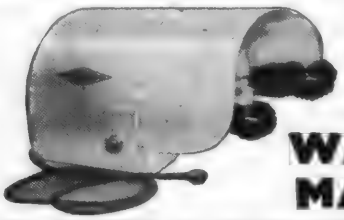

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FOR Sale, stock in trade of small pickle factory, comprising vegetables in brine, new jars and bottles and miscellaneous tools and gear. Seen Lancs. Sold in bulk or item by item.—Stock list available on application. Box B2359.

FOR Sale, Screw Caps, Tinplate, 600 gr., 20 mm., 1s. 9d.; 1,000 gr., 24 mm., 2s. 2d.; 1,000 gr., 25/26 mm., 2s. 3d.; 800 gr., 27 mm., 2s. 6d.; 200 gr., 35 mm., 3s. 8d. (special wads); 300 gr., 27 mm., 3s.; 300 gr., 70 mm., 7s. 3d.; 1,000 gr., 14 mm., Bakelite, 2s. Tins, 100 gr., 3½ by 2½ by ⅞ in., 9s.; 100 gr., 1 oz. aluminium ointment. 8s. 6d.; 50 gr. 2 oz. Gold/lac, 10s.—Write Box B2361.

FOR Sale, 250 Casks Silverskin Onions, A1 and B2. £12 per cask, part lots; offers for one lot welcomed.—Box B2362.

REFINER, 3 granite rollers, approximately 12 in. by 5 in., excellent condition. Wanted small jogger for sieving.—Box. B2364.

1-LB. glass jars for sale, quantity approx. 200,000.—T. Gunn (Rayleigh) Ltd., 206, London Road, Rayleigh, Essex. Tel.: Rayleigh 87.

STEAM Cooking Retorts, new, from stock, 36 in. by 72 in. by 36 in. high. Steel plate construction. With two inside trolleys. For 10 lb. sq. in. working pressure.—Details from F. J. Edwards Ltd., 359, Euston Road, London, N.W.1. Tel.: Euston 4681.

WAXED Cartons with lids; new, perfect condition, 4-oz., 4½-oz. and 6-oz. capacity. Keen prices, immediate delivery.—Bak-In It Case Co., Reddish, Stockport.

TUBULAR Steel Trucks of amazing lightness and strength, fitted with platform, 5 ft. by 2 ft. 9 in., and metal-bound hinged sides 8 in. high, two roller-bearing wheels fitted with pneumatic rubber tyres. Easily handled from either end. Capacity 10 cwt. Immediate delivery. £12 17s. List on request.—The Sterling Pump Co., Ltd. Spalding.

WE are pleased to offer for quick delivery new fully Automatic Labelling Machines with outputs up to 8,000 bottles per hour for manufacturers on export production. Please send sample bottles and labels for a quotation.—Box B2308.

The Strongest Vanilla Flavour
VANOLEUM
1 oz. (2/6) makes a pint of essence
For further details apply.
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SPIRAL TUBE
UNIT HEATERS
for processes and factory heating
The Spiral Tube & Components Co. Ltd.
Osmaston Park Road, Derby

MISCELLANEOUS SALES

PROMPT delivery, new, 7-oz. and 10-oz. Tomato Ketchup bottles, 8-oz. Square Sauce, 2½-oz. and 5-oz. Olive Oil Bottles, Vinegar Bottles, Wine or Gin Bottles, Mineral Water, 4-oz., 7-oz. 10-oz. Bottles; over 50,000 gross new plain and fancy bottles and jars at reasonable prices. Also cartons, cases, tins.—Telephone Grosvenor 1936. Commercial Container Co., 17 Dover Street London, W.1.

LINEN Bags, 1st quality, 7½ inches by 11½ inches. Approx. 500,000 available. Already printed front and back.—Offers invited to Box 522, George Murray (Advertising) Ltd., 184, Strand, London, W.C.2.

DATE Syrup, imported. Limited supplies available only to direct users.—Please apply Box B2312.

BENZALDEHYDE, chlorine-free (M. & B. Amandol). Offering one ton 15% under manufacturers' price.—Please apply Box B2313.

NEW Tilling-Stevens motors, ¾-1½ h.p. single phase; 1½-2 h.p. 3 phase, ex stock. Push Button Starters for Fraction h.p. motors, fitted with three overloads, ex stock; other motors up to 100 h.p. with Starters. Switch Fuses 10, 15-amp D.P. and T.P. ex stock.—Dept. 9, Wm. Don & Partners, Crown Chambers, 45, Hunslet Road, Leeds, 10. Tel.: Leeds 27580.

MISCELLANEOUS WANTS

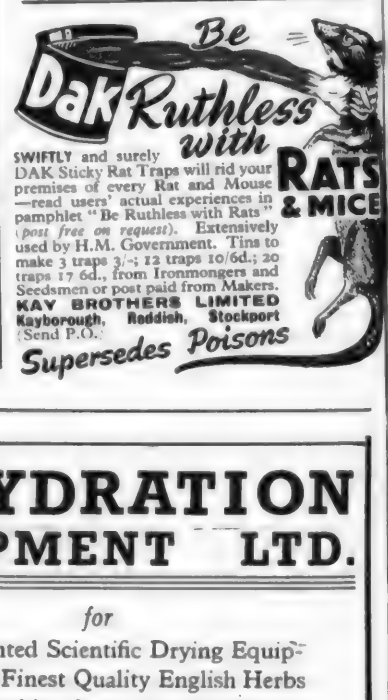
ANY type of Steel Buildings urgently required by engineering firm on export work. Buildings will be immediately inspected.—Box B2179.

LACTOSE B.P. required in small or large quantities.—Box B2343.

STIRRERS, propellor type or vertex, laboratory and commercial sizes, urgently wanted.—Please write giving full details to Box B2373.

STONE jars, 200/300, capacity two or three gall., with stoppers or tops.—Box B2375.

FOOD Manufacturing and/or Wholesale Grocery business required Liverpool, Manchester or Leeds area. Minimum turnover £150,000 p.a. Preliminary details strictest confidence, or through third party if desired, to Managing Director, Box B2354.



SWIFTLY and surely DAK Sticky Rat Traps will rid your premises of every Rat and Mouse —read users' actual experiences in pamphlet "Be Ruthless with Rats" (*post free on request*). Extensively used by H.M. Government. Tins to make 3 traps 3/-; 12 traps 10/6d.; 20 traps 17 6d., from Ironmongers and Seedsmen or post paid from Makers.
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SITUATIONS VACANT

MANAGER for new Food Factory (Fish and Meat Paste), Norfolk/Suffolk border. Man with experience and initiative required.—Write full particulars to Box B2346.

MANUFACTURERS of Synthetic Cream require Research Chemist with sound experience in this line.—Write Box B2349.

AMBITIOUS gentleman with energy, intelligence, initiative and personality required to take up responsible position with great prospects for the future. Knowledge of the food trade and good salesmanship an advantage.—Application in confidence to Box B2350.

CHOCOLATIER: Applications are invited by well-known London Manufacturing House for a Chocolatier. Full experience is essential and applicants must be well versed in all branches of the Chocolate Trade. Permanent post for suitable applicant.—Write stating age, experience and salary required to Box No. 3718, c/o E. W. Barney Ltd., 4, New Court, Lincoln's Inn, W.C.2.

KEEN, experienced charge-hand wanted for small food processing plant, East London. Good prospects for suitable man.—Box B2351.

A REPRESENTATIVE required for well-known food manufacturers, to call on Ice Cream, Bakery, Confectionery, Canteens, Institutions and allied trades. Only an experienced representative required (car owner preferred). Salary, expenses and commission.—Box B2353.

WORKS Chemist: Graduate required by London firm of national repute, to take full charge of laboratory and factory control. Wide range of products. Preference given to keen, industrious young man with thorough practical experience in all branches of the Food Trade. This is a permanent post, offers unlimited scope, and carries considerable responsibility. Salary £624 per annum, progressive basis.—Full details in confidence, Box B2374.

PORTUGUESE West Africa (Angola): Wanted by jam factory in Angola, specialist in marmalade, jams and tinned fruits production. Chemical knowledge essential. Return fare, expenses and attractive remuneration.—Offers to Box B2356.

THE Directors of the Co-operative Wholesale Society Ltd. invite applications for the position of Assistant to the Resident Manager at the Society's Preserve Works, Middleton, near Manchester. Candidates should have a good knowledge and sound experience of the manufacture of Preserves, Pickles and Sauces, Vinegar Brewing, Canned Fruits, Xmas Puddings and Cured Peel. Administrative experience is essential, together with ability to organise and control labour.—Applications stating age, qualifications, experience and salary required to be addressed to the Grocery Committee, C.W.S. Ltd., 1, Balloon Street, Manchester, 4, endorsed "Assistant to Resident Manager, Middleton."

CHIEF Engineer required for well-known Food Manufacturing Company in the Midlands. Experience in the control of general factory maintenance, plant layout and installation is essential, and preference will be given to those who have a knowledge of food processing and packaging machinery. Permanent position, offering good scope for initiative. Pension scheme. Applicants should not be under 35 nor over 45. Salary according to experience.—Apply Box B2357.

AREA managers required to supervise and direct representatives calling upon Bakery, Canteen, Catering and Grocery trades. Administrative experience of controlling representatives essential, and a good knowledge of the above trades preferred. Good salary and prospects.—Box B2358.

CHEMIST: Young Chemist required to assist Works' Chemist in manufacture and compounding of various food products. Previous factory experience not essential. Excellent prospects. Old established company, London district.—Write fully stating age, experience, when free and salary required. Address application to Box B2360.

WORKS Manager required for Food Manufacturers. Must be able organiser and administrator, knowledge of production an asset. Please state qualifications. Salary according to experience.—Apply Box B2368.

WANTED, representatives calling on Food Manufacturers, Bakers' Sundriesmen, Bakers, etc., to handle attractive lines of essential materials. Good commission.—Box B2300.

DRAUGHTSMAN required in Engineer's Office of Canning Factory in East Anglia, preferably with experience of Food Plant. Single man preferred owing to housing accommodation. Knowledge of Steam, Water, and Effluent Disposal layouts an advantage.—Write full particulars of experience and salary required, Box B2329.

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SITUATIONS VACANT

FOOD Analyst. A recently qualified chemist who has had experience in Food Analysis is required by a manufacturer in N. Ireland, to take charge of the analytical work involved in producing a range of canned foods and speciality cereal products. Initial salary £400/500 p.a.—Applications to Box B2332.

MANAGER required for East African Coastal Edible Oil Refinery. Age 25-35 years, preferably single. Experience in food manufacture, costings and administration essential and with at least Inter B.Sc.—Apply with full particulars, including salary required, to Box 1316, Nairobi, Kenya.

TWO young experienced Canners required for Food Factories in East Africa. Must be capable of taking charge of canning lines.—Apply with full particulars, including salary required, to Box 1316, Nairobi, Kenya.

CHEMICAL Engineer required, fully qualified, with lengthy experience in the Technology of Vegetable Oil Hydrogenation and production of Edible Fats and Margarine, to fill a senior position in an edible oil refinery in Bombay. Executive ability essential in production, administration and maintenance.—Box B2341.

ASSISTANT Engineer, age 25-40, required with some practical experience in the design and development of light machinery for a process industry. Mechanical Engineering degree or equivalent.—Apply in writing, giving age, full particulars of qualifications and experience to the Organisation Secretary, Ilford Limited, Romford, Essex.

MAN with practical experience in the manufacture of technical and edible gelatine from bones and hides required. High scientific qualifications not necessary, but thorough practical experience essential.—Please write giving full particulars to Box B2344.

OLD-ESTABLISHED Food Manufacturers and Canners require an Assistant Works Manager for their factory in the Home Counties. Applicants should be between 27 and 35 years of age, have had supervisory and/or managerial experience in some branch of the Food Industry and, preferably, have an engineering background.—Give full details (in confidence) in first letter to Box B2378.

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FOR SALE

ONE Self-generating Caramel Mixer, comprising jacketed Copper Pan, 2 ft. 2 in. diam. by 1 ft. 9 in. deep (to take 1 cwt. of toffee). Pan mounted on c.i. stand and provided with fast and loose pulley driven bow and scraper type agitator, pan arranged to tilt, suitable for 100 lb. working pressure. Rise and fall of agitator mechanically operated. Gas stove with small blower fitted under pan, blower driven by pulley from main shaft. Heat applied to water by gas burner and steam generated in jacket of pan.

Stainless steel Food Preparation Tables, 7 ft. 8 in. by 3 ft. 8 in. by 2 ft. 8 in. high and 5 ft. 8 in. by 2 ft. 8 in. high. Polished, with adjustable feet. Available for delivery mid-December.

One Twin Roll Drier by Goudche of Gouda, Holland. Rolls 6 ft. 7 in. long by 2 ft. 3 in. diam. steam-heated through trunnions and driven from 10 h.p. 400/3/50 electric motor through 1000:61 reduction gearbox on common bedplate. Drier equipped with fume hood, 2 discharge worm conveyors and one spare roll.

All types of stainless steel Storage and Process Vessels. Large stock available for immediate delivery.

Four stainless steel Steam-Jacketed Tilting Mixers. 18 in. diam. by 18 in. deep, mirror finish inside and out, rubber covered paddle agitator. Driven through Croft Worm Reduction Gearbox from ½ h.p. Crompton Parkinson totally enclosed geared motor with Allen West Starter. Mixers mounted in "A" frames.

One Electric Mincing Machine by Lancashire Dynamo & Crypto, type A.12, for 200/220 v. single ph. 50 cyc., complete with 16 in. diam. white enamel feed bowl.

One "U"-shaped horizontal unjacketed Dough Mixer by A. Hunt, 2 sack size. Mixer body 3 ft. 8½ in. long by 2 ft. 2½ in. wide by 2 ft. 10 in. deep, fabricated from sheet aluminium with c.i. ends. Vitreous enamelled double helical agitators Drive through totally enclosed reversing gearbox. Automatic tilting. Mounted on c.i. bedplate fitted with tempering tank, 18 in. by 16 in. by 32 in. deep.

One 2-stage Curd Mill by Gardner, comprising 2 sets of twin serrated rolls, 1 ft. 10 in. long by 9 in. diam. Each pair of rolls spring loaded and independently driven through gearing by belt pulley. First pair of rolls arranged vertically above second pair. Frame c.i. construction fitted with 3-hinged inspection doors, 14 in. long by 5 in. wide.

One Vacuum Evaporating Plant by Morton, comprising tinned copper Pan, approx. 8 ft. overall depth by 5 ft. i.d. Steam-jacketed with internal steam coil of 3 in. o.d. solid drawn copper pipe, complete with condenser and vacuum pump. Capacity of evaporator 300 gall. per hour.

One 3-throw Homogeniser by Astra, approx. capacity 300 gall. per hour, 1¼ in. bore by 4¾ in. stroke, bronze rams and pump block, triple roller chain driven, eccentric mechanism enclosed in oil bath, 2½ in. inlet, ¾ in. outlet. No motor included.

One 4-throw Homogeniser by Rannie, of Copenhagen, capacity approx. 300 gall. per hour, 1¼ in. bore by 2¼ in. stroke. Fitted stainless steel rams and pump block, and bronze guide bearings running in c.i. outercasing, 1⅞ in. diam. inlet and 1¼ in. diam. outlet. Drive by twin inserted-tooth sprocket and chain. Motor platform mounted over machine. Motor not available.

One Baker Perkins Twin Roll Dough Break Steel Rolls, 24 in. by 8 in. diam., driven through gearing, and 20 in. by 3½ in. fast and loose and reversing pulleys. Cast iron side feed tables, 26 in. wide by 44 in. long.

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WORKS Manager, 43 years of age, excellent health, first-class mechanical engineering and administrative ability: 25 years' continuous experience in the food manufacturing industry, seeks a similar position or that of engineer. Country district preferred. Excellent references.—Box B2340.

ADVERTISER with wide administrative and technical experience in the Food-Packing Industry, seeks post as production manager with reputable firm. London area. Present position in same capacity held for over 7 years.—Box B2366.

FOOD Technologist, 34 years, trained bacteriologist, 13 years' experience modern canning practice, factory management, laboratory and production control. Extensive knowledge and experience mechanisation and plant maintenance. Responsible position required homeor abroad.—Write Box B2330.

TECHNICAL Director (D.Sc.) of large nationally well-known firm producing a variety of branded foods desires change giving greater scope. Excellent scientific background combined with first-class practical experience. Age 38. Great Britain or Dominions.—B ox B2258.

WANTED, administrative position fruit, vegetable Canning industry, either U.K. or South America. Previous experience and training in England and India. Contact cable or air.—Karkare, Oppo. Distillery, Nasik Road, India.

CANNERY Manager, age 40, 16 years' practical experience all branches English Fruit and Vegetable Canning, etc. Last 9 years complete control up-to-date Cannery, output average million cans per month. Able to take charge any Cannery this country or go elsewhere if to advantage.—Box B2369.

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CANADA: Business man with extensive knowledge of Canadian market, leaving end of January for trip to Canada, wishes to contact firms interested in marketing or manufacturing their goods in Canada.—Reply to Clawson, 31, Exeter Road, London, N.W.2. Gladstone 6165.

ADVERTISERS are interested in receiving enquiries for the supply of bottles and jars suitable for packing tomato, ketchup, meat paste and other types of foodstuffs. Production would be in 1949 and in large quantities only. Moulds made to customer's own specification.—Apply 15a, Whitcomb Street, Pall Mall East, London, W.C.2.

WELL-KNOWN Food Manufacturers with factory premises in Eire, are open to undertake the manufacture and packing in Dublin of other manufacturers' goods for Eire and export markets. Sale and distribution on the Eire market can also be undertaken, if desired.—Box No. M. 4305, Haddons', Salisbury Square, London, E.C.4.

CAPACITY of up to 300 gross per week available for bottling of Sauces, Vinegars, Creams, etc. Modern factory and equipment. Bottles supplied if necessary. Collection and delivery arranged. Near London.—Box B2370.

MANAGING Director, Food Manufacturing and Pre-packing concern in the Isle of Man, is prepared to sell controlling interest as and from May 1, 1949. Excellent opportunity, spacious premises. Good range of stock.—Apply, first instance, Box B2372.

LONDON wholesalers would like to hear from importers and manufacturers regarding offers for their grocery and catering trade.—Box B2376.

CONSULTANT: Manufacturers experiencing any difficulties or problems to be overcome are invited to consult a Technologist who has 40 years of reputed practical knowledge of the food canning industry to his credit, including bacon curing, sausages and open packs of continental specialities. Estimates prepared and new departments or factories planned out on most up-to-date lines.—Write Consultant, Deptm. BM/GHNT, Monomark House, Bloomsbury Street, London, W.C.1.

FORMULÆ and methods for making all kinds baker's sundries. Write for special terms.—Box B2365.

THE Electroplant Company, Wembley, for any type of special duty elec. plant. Specialities Converters, Gen. Sets, Electrical test equipment. Ask for production range.

A SKILLED team of Engineers and Fitters available for outside erection or dismantling, survey, inspections, etc., of large power plant of any description.—For details write to G.P.U., Ltd., Service Division, Wembley.

FULL steam in five minutes with B. & A. Electrode Boilers, used by British industries for 20 years. No boilerhouse, no flue, no attendant needed. The most compact and convenient steam raisers available, can go beside machines using the steam.—Write for Leaflet 125, Bastian & Allen Ltd., 11, Bedford Square, W.C.1.

OWNERS of old-established businesses wishing to retire should consult Business Brokers Ltd., 46, St. James's Place, London, S.W.1 (Regent 4720). Many buyers available, particularly for large propositions.

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NATION-WIDE sales organisation with remarkable record of successful merchandising is open to consider one or two new lines. Only branded lines offering possibilities of big permanent business are of interest.—Box 553, c/o Erwoods Ltd., 211, Piccadilly, London, W.1.

ADVERTISER with Capital and Small Factory Premises available invites propositions from Food Manufacturers, Distributors, etc. London area.—Box B2338.

MONOMARK Service. Permanent London address. Letters redirected. Confidential. 5s. p.a. Royal patronage.—Write Monomark BCM/MONO55, W.C.1.

BELGIAN jam manufacturer would consider manufacturing on behalf of one or more substantial British firms. For fuller particulars apply to T. Gunn (Rayleigh) Ltd., 206, London Road, Rayleigh, Essex.

WEST Sussex Grower with excellent facilities and expert knowledge wishes to contract for growing of specialised crops to food manufacturers' requirements, up to 20 acres available next season.—Box B2269.

FIRM in North of England, having established connection with Chocolate, Toffee and Biscuit Manufacturers throughout the British Isles since 1908, is willing to represent manufacturers of raw materials for these trades on commission and expenses basis.—Box B2166.

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VITAMINISATION Patent 576054: Very exceptional opportunity to acquire sole rights at nominal price. Valuable process of proved validity for all degrees of biscuits, etc., enrichment guaranteed. Entirely practicable, simple and low cost.—Enquiries, H. R. J., 34, Bath Road, Maidenhead.

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12-in. Steam-jacketed Worm, 12 ft. long, ball bearings, crescent blades, wanted for immediate use.—Details to Morning Foods Ltd., North Western Mills, Crewe.

REQUIRED for Marmalade Pulping one quartering, peeling, separating and pulping machine. Also one Orange Peel Shredding machine with adjustable cutters.—Box B2367.

WANTED, modern horizontal or vertical Diesel Engines in good working order. Should be available for quick delivery.—George Cohen Sons & Co. Ltd., Wood Lane, London, W.12, or Stanningley, Nr. Leeds.

WANTED to purchase Power Cake Crushing Mill with two pairs of rollers.—Apply Lloyd Rakusen & Sons Ltd., Meanwood Road, Leeds 7. Tel.: Leeds 31081.

WANTED, plate and frame type press, 100 sq. ft. filtering surface. Common inlet and outlet. Plates and frames of wood. Other parts of mild steel. Frames to give 1 in.-1½ in. space.—Box B2377.

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ELECTRIC machine for cutting, slicing, shredding beetroot, red cabbage, rhubarb, etc., as new.—Box B2363.

GARDNER (Jacketed), 500 lb., Dryer/Mixer, unused, £220; Werner twin "Z" Tipping Paste Mixer, 4 cu. ft. capacity, £120; Steriliser or Retort, 18 in. diam. by 36 in. deep, unused, £90; 4 h.p., 3 phase motor, 960 r.p.m., with starter, £35.—Box B2342.

WERNER type double "Z" Mixers, 10 to 20 gall.; Revolving Drum Mixer, 4 ft. by 2 ft.; Horizontal Powder Mixer, 4 cu. ft. size with or without driving motor; 1½ sack Artofex Dough Mixer; Broadbent 48 in. and 36 in. electric-driven hydros; 12-ton Refrigerating Plant.—Winkworth Machinery, 65, High Street, Staines. Tel.: 1010.

FOR Sale: Drained Orange or Lemon Peel cutting machine by Morton, Winhaw. Good working order. Reasonable price.—Box B2345.

BOWL Cutter by W. T. Ovens, 100 lb. capacity. Direct coupled to 12 h.p. A.C. motor, complete with starter; can be seen working. Werner Type "Z" Blade Mixer; belt drive; complete with motor and starter. Ammonia Compressor by Haslam, 7½ in. by 7 in. Vertical Twin Cylinder, direct coupled to 56 h.p., 3 phase slip-ring motor, running at 410 r.p.m. with switch gear. Delivery early 1949. Can be seen working. Also two sets of coils. —S. Frost & Company Ltd., Subarctic House, Larkhall Lane, Clapham, S.W.4.

DENT Hellyer Jacketed Retorts (lined), 18 in. by 36 in. deep, with swing cover; Artofex 1½ sack Mixer; Gardner Jacketed Ribbon Bladed Dryer, 9 cu. ft.; Werner twin "Z" Tipping Mixers, 15/20 gall.; Broadbent 48 in. electric-driven Hydro.—Write for list, Winkworth Machinery, 65, High Street, Staines.

VACUUM Filling Machines for sale, single, 2- and 3-head fillers, fully motorised, fills from 4-oz. bottles to gallons. Immediate delivery. Any liquids, sauces, Mayonaise, etc.—Box B2347.

PHONE 98 STAINES

GARDNER Horizontal Power Mixer 5 ft. by 19 in. by 21 in.; Young's Powder Sifter and Mixer; 100 gall. Copper Jacketed Still and Condenser; Stern Haslam Ammonia Refrigerator Plant; Artofex Bowl Mixer; Miracle Mill 24 in. dia.; 3 ft. 6 in. Edge Runner Mill (Stainless Coated); Electric Hydro Extractor 36 in., 415/3/50; "G.E.C." Electric 2 Deck Baking Oven.—Harry H. Gardam & Co. Ltd., Church Street, Staines.

VEGETABLE Dicers, twin head; Benham 4-Oven Steamer; Drying Oven, 6 ft. by 3 ft. 6 in. by 5 ft.; Peerless Potato Peeler, VP 28 model; B.C.H. Fruit Strigging Machine; Gooseberry Snibber; B.C.H. Candied Peel Cutter; 30/80 quart Planetary Mixing and Whisking machines by "Hobart," "Read," "Peerless"; Brass-lined Paste Mixer; Werner "Z" arm mixer 15 in. by 8 in. by 12 in.; Burnell ½-ton Drum Kneader or Mixer; Open Bowl Kneaders, 1 sack and ½ sack; B.C.H. Open Pan Fondant Mixer; Jacketed Mixing Kettles, 350-lb. size; Drying Rolls 26 in. by 12 in. dia.; 3-roll horizontal steel refiner, 26 in. by 12 in. dia.; 3-roll Vertical Chilled Steel Refiner; "Turner Vertical Double Twin Roll Mill, 25 in. by 9 in. rolls, for rice or cereal milling; Gardner's Power Kibbler; Collier 18 in. flat-disc Grinder; Ideal Pulverising Grinding Mill; Gardner Centrifugal Reel Dresser, 5 ft. by 17 in. dia.; "Bartlett" 1-cwt. Gas-fired Roaster; Lehmann 2-cwt. Bean Roaster, open firing, open discharge; Triple flat stone Liquid Cocoa Mill, 26 in. dia. stones; Granite Melangeur, 4 ft. 6 in., with granite twin head stones; Reiche Chocolate Drop Press; Chocolate Enrobers, 16 in., with tunnel cooler, 50 ft. ammonia coils, chocolate bar and figure moulds; Rose Twist Wrapping Machine, ¾ in. by ¾ in.; Plastic Cut and Wrap Machines; Can or Bottle Labelling Machine, 120 per minute output; Wire Stitching Machines; Cardboard Slotter and Cornering Machine; Cardboard Hand Shearing Machine; B.C.H. Caramel Press; Caramel Cutters; Brakes, Nougat and Cream Cutters. A small selection of our stock, all enquiries invited.—E. W. Wallbridge, 136, Sefton Street, Southport. (Cables: Wallbridge, Southport.)

JACKETED Werner-type Mixer by Baker Perkins, 21 in. by 20½ in. by 18½ in., double Z blades, safety locking lid, fast and loose pulleys; Bowl Chopper by John Gardner, bowl size 39 in. diam. by 11 in. deep; Buffalo Bowl Chopper by Smith, bowl size 30 in. by 8 in. deep; Hills Bottle Washing Machine, 50 doz. per hour, complete with A.C. motor; 3 Labelling Machines by J. W. Flower, complete with motors; 55-gall. capacity Copper Jacketed Boiling Pans, 65 lb. working pressure, hand tilting.—Box B2254.

SECOND-HAND PLANT FOR SALE

HODSON & CO. (Machinery), Ltd., Tottington, Bury, Lancs., England, for Surplus Chemical Plant. Immediate delivery. Low prices.

LABELLERS for quick delivery. We have a number of New Labelling Machines available for quick delivery. Machines will handle a wide range of bottles and labels. Send details of your requirements, including sample labels.—Box B2031.

FOR Sale, one "E" size Gardner Sifter and Mixer, complete with 3-h.p. A.C. motor.—Richard Sizer Ltd., 21, Dale Street, Liverpool, 2.

3 CWT. size Combined Sifting and Mixing Machine, new, with or without 3-h.p. A.C. motor.—Makers, D. Burr & Son, Drayton Engineering Works, Drayton Place, West Croydon.

NEW Wright and Marvin Model "A" Round Can Labelling Machine, complete with A.C. motor; Purdy Junior Labelling Machine; 2 Labelling Machines by J. W. Flower, complete with motors; Mikro Pulveriser, Model No. 2 T.H., £150; Horizontal Drum Mixer by Burnell, 2 ft. long by 3 ft. diam., belt driven; £100.—Box B2255.

WE have the largest stock of Can-making Machinery in the country, comprising: Body Formers by Bliss and Troyer Fox, Flangers, Double Seamers and Stationary Closing Machines by the world's best makers. Send us your enquiries for small units or complete installations.—F. J. Edwards, Ltd., 359, Euston Road, London, N.W.1.

VACUUM Bottle Filling Machine, two or three heads, complete with motorised pump, suitable for all size bottles and any liquids. New condition —The English Orchard Co. Ltd., 89-85, Evelina Rd., Nunhead, S.E.15.

ROUND Can Labelling Machine by Wright and Marvin Ltd., Model "A," motorised. One ditto by Beth.—Full details from Box B2196.

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HORIZONTAL Steam Retort, 6 ft. by 3 ft. by 3 ft., complete with trolleys and trays, as new: Rotary Can Filling Machine, 8 head, complete with can conveyor, 110 cans per minute.—Box B2380.

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SIX Werner-type Jacketed Tilting Mixers by Baker Perkins with double cast iron almost fully jacketed pans, size 28½ in. by 30½ in. by 28½ in. deep, fitted with heavy fin mixing blades, driving shaft for adaption for either pulley or motorised drive, in perfect condition.—Box B2382.

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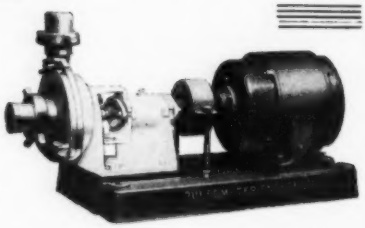

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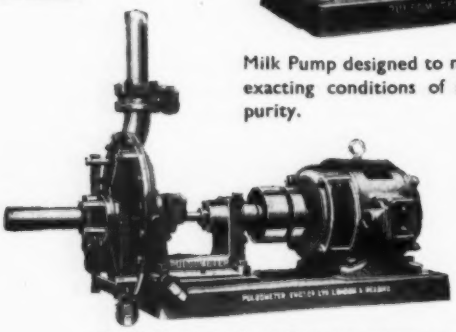

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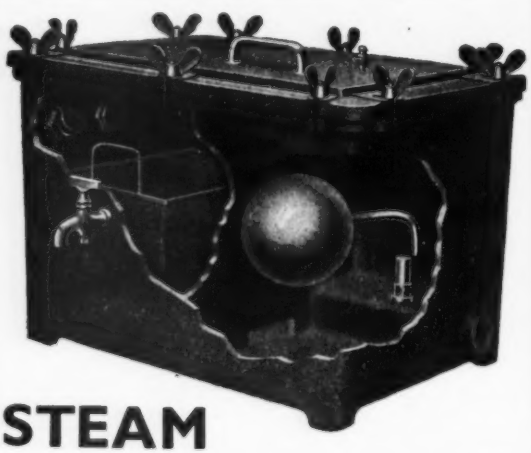

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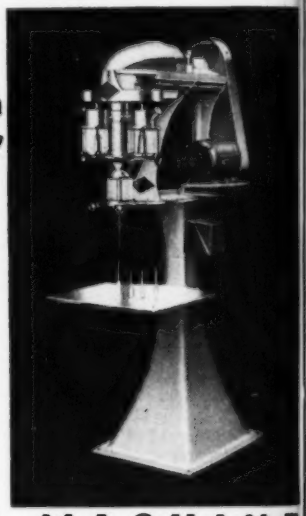

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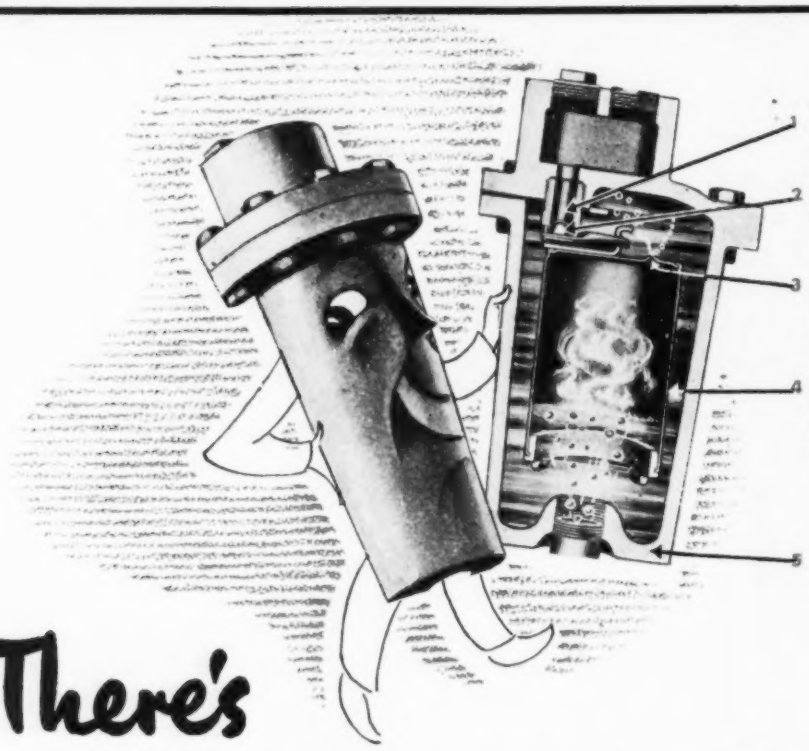
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